# Wisconsin Department of Transportation

**Division of Transportation Systems Development**
Bureau of Project Development
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*August 2, 2024*

## NOTICE TO ALL CONTRACTORS:

**Proposal #16: 7840-03-73, WISC 2024421**
**Black River Bridge B-10-0398**
**USH 10 - Greenwood**
**CTH G**
**Clark County**

## Letting of August 13, 2024

This is Addendum No. 01, which provides for the following:

### Special Provisions:

| **Revised** Special Provisions | |
|---|---|
| Article No. | Description |
| 26 | QMP Drilled Shafts. |

| **Added** Special Provisions | |
|---|---|
| Article No. | Description |
| 28 | Crosshole Sonic Log (CSL) Testing, Drilled Shaft Foundation 54-Inch, Item SPV.0060.06. |
| 29 | Thermal Integrity Profiler (TIP) Testing, Drilled Shaft Foundation 54-Inch, Item SPV.0060.07. |
| 30 | Drilled Shaft Foundation 54-Inch, Item SPV.0090.03. |

| **Deleted** Special Provisions | |
|---|---|
| Article No. | Description |
| 21 | Crosshole Sonic Log (CSL) Testing, Drilled Shaft Foundation 48-Inch, Item SPV.0060.03. |
| 22 | Thermal Integrity Profiler (TIP) Testing, Drilled Shaft Foundation 48-Inch, Item SPV.0060.04. |
| 25 | Drilled Shaft Foundation 48-Inch, Item SPV.0090.02. |

### Schedule of Items:

| **Revised** Bid Item Quantities | | | | | |
|---|---|---|---|---|---|
| Bid Item | Item Description | Unit | Proposal Total Prior to Addendum | Proposal Quantity Change (-) | Proposal Total After Addendum |
| 502.0100 | Concrete Masonry Bridges | CY | 801 | 17 | 818 |
| 505.0400 | Bar Steel Reinforcement HS Structures | LB | 51,530 | 10,930 | 61,920 |

| | | | | | |
|---|---|---|---|---|---|
| 628.1504 | Silt Fence | LF | 2660 | -710 | 1950 |
| 628.1520 | Silt Fence Maintenance | LF | 2660 | -710 | 1950 |

| **Added** Bid Item Quantities | | | | | |
|---|---|---|---|---|---|
| Bid Item | Item Description | Unit | Proposal Total Prior to Addendum | Quantity Added | Proposal Total After Addendum |
| SPV.0060.06 | Crosshole Sonic Log (CSL) Testing, Drilled Shaft Foundation 54-Inch | EACH | 0 | 6 | 6 |
| SPV.0060.07 | Thermal Integrity Profiler (TIP) Testing, Drilled Shaft Foundation 54-Inch | EACH | 0 | 6 | 6 |
| SPV.0090.03 | Drilled Shaft Foundation 54-Inch | LF | 0 | 294 | 294 |

| **Deleted** Bid Item Quantities | | | | | |
|---|---|---|---|---|---|
| Bid Item | Item Description | Unit | Proposal Total Prior to Addendum | Proposal Quantity Change (-) | Proposal Total After Addendum |
| SPV.0090.02 | Drilled Shaft Foundation 48-Inch | LF | 291 | 291 | 0 |
| SPV.0060.03 | Crosshole Sonic Log (CSL) Testing, Drilled Shaft Foundation 48-Inch | EACH | 6 | 6 | 0 |
| SPV.0060.04 | Thermal Integrity Profiler (TIP) Testing, Drilled Shaft Foundation 48-Inch | EACH | 6 | 6 | 0 |

**Plan Sheets:**

| **Revised** Plan Sheets | |
|---|---|
| Plan Sheet | Plan Sheet Title (brief description of changes to sheet) |
| 20 | Miscellaneous Quantities |
| 23 | Miscellaneous Quantities |
| 76 | General Plan & Elevation |
| 77 | Cross Section (Change column/drilled shaft diameter) |
| 78 | General Notes & Quantities (Change quantities and drilled shaft items in general notes) |
| 80 | Subsurface Exploration (Changed column/drilled shaft diameter) |
| 81 | Subsurface Exploration (Changed column/drilled shaft diameter) |
| 93 | Pier 1 (Drilled Shaft and Column Diameter) |
| 94 | Pier 1 Details (Updated Bill of Bars and Shaft Cross Section) |
| 95 | Pier 2 (Drilled Shaft and Column Diameter) |
| 96 | Pier 2 Details (Updated Bill of Bars and Shaft Cross Section) |

The responsibility for notifying potential subcontractors and suppliers of these changes remains with the prime contractor.

Sincerely,

*Mike Coleman*

Proposal Development Specialist
Proposal Management Section

**ADDENDUM NO. 01**

**7840-03-73**

**August 2, 2024**

**Special Provisions**

## 21. DELETED

## 22. DELETED

## 25. DELETED

## 26. QMP Drilled Shafts.

*Replace section titled* **A General** *with the following:*

### A General

This special provision describes performing work conforming to standard spec 501, 502, 701, 710, and 715 (conform to QMP Concrete Structures) except as deleted or additionally stipulated herein. This specification applies to all drilled shaft concrete placed under the following bid item:

| | |
|---|---|
| SPV.0090.02 | Drilled Shaft Foundation 54-Inch |

## 28. Crosshole Sonic Log (CSL) Testing, Drilled Shaft Foundation 54-Inch, Item SPV.0060.06.

### A Description

#### A.1 General

This special provision describes providing specialized equipment and trained testing personnel and to perform Crosshole Sonic Log (CSL) testing of drilled shafts according to the plans and as hereinafter provided. CSL testing is required for shaft foundations for Structure B-10-398.
Crosshole Sonic Logging, (CSL), is a nondestructive testing method that measures the time for an ultrasonic pulse to travel from a signal source inside an access tube to a receiver inside another access tube and evaluates the integrity of drilled shafts.

#### A.2 CSL Testing Personnel Requirements

Provide a CSL testing expert to direct and perform all aspects of the CSL testing and provide interpretation of results. The CSL testing expert shall be a professional engineer licensed in the State of Wisconsin, be employed by an independent testing agency, and have experience on a minimum of 5 projects performing CSL testing of drilled shafts. The independent testing agency shall have a minimum of 3 years of experience in performing CSL testing of drilled shafts. Submit the qualifications of the proposed CSL testing expert to the engineer for approval prior to beginning drilled shaft installation.

### B (Vacant)

### C Construction

#### C.1 CSL Testing Coordination

Schedule and coordinate drilled shaft construction with the CSL testing expert. Alter normal construction procedures as necessary to facilitate the CSL testing procedure. This includes providing suitable and safe

access to the site and specific locations of drilled shafts to be tested and aiding the CSL expert to facilitate the CSL testing.

**C.2 CSL Testing**

Perform CSL testing and analysis on each completed drilled shaft. Conduct CSL testing according to ASTM D 6760. Notify the engineer of the date and time of each CSL test at least 48 hours prior to the scheduled test. Perform CSL testing after the drilled shaft concrete has cured at least 72 hours and after the concrete compressive strength reaches or exceeds 2,500 psi.

Pull the CSL probes simultaneously, starting from the bottoms of the access tubes, over an electronic depth measuring device. Perform the CSL tests with the source and receiver probes in the same horizontal plane. Continuously record CSL signals at depth intervals of 2.5 inches or less from the bottom of the tubes to the top of each shaft. Perform CSL testing on every possible tube combination.
Immediately report potential local defects indicated by testing to the engineer.
Grout the access tubes after testing is complete, at the direction of the engineer. Place the grout with a pump, starting at the bottom of each access tube.

**C.3 CSL Evaluation**

Evaluate the concrete in the shaft using the following classification on each CSL profile:

- Satisfactory:
    - FAT increase 0% to 20%, and;
    - Energy reduction less than or equal to 9 decibels
- Defect:
    - FAT increase greater than 20%, or;
    - Energy reduction greater than 9 decibels

**C.4 CSL Testing Reports**

Within three working days of completion of CSL testing and receipt of shaft construction record, submit a CSL Testing Report for each tested drilled shaft to the engineer summarizing CSL testing results. At a minimum the CSL testing reports must include:

1. A description of the testing equipment, the date and location of test, and the number of days between concrete placement and CSL testing.
2. The CSL ultrasonic profiles with analyses of the following all tube pair combinations tested:
    a. First pulse arrival time (FAT) versus depth.
    b. Relative pulse energy / amplitude versus depth.
    c. A presentation of the nested signal peak as a function of time plotted versus depth (waterfall diagram).
    d. Note all shaft-specific construction information (e.g. elevations of the top of shaft, bottom of casing, bottom of shaft, etc.), on all pertinent graphical displays.
3. Indication of size and location along the depth of the shaft of all defects.
4. A discussion and assessment of the data quality and integrity of the tested drilled shaft, including a discussion of all interpretations in conflict with the evaluation criteria in subsection C.3, as well as a discussion of all other unusual results.
5. Conclusions or recommendations concerning the acceptability of the drilled shaft based on the interpretation of the CSL testing results against the evaluation criteria in subsection C.3.

**D Measurement**

The department will measure Crosshole Sonic Log (CSL) Testing pay items by the unit for each drilled shaft tested, acceptably completed, regardless of the number of access tubes in the shaft.

### E Payment

The department will pay for measured quantities at the contract unit price under the following bid item:

| ITEM NUMBER | DESCRIPTION | UNIT |
|---|---|---|
| SPV.0060.06 | Crosshole Sonic Log (CSL) Testing, Drilled Shaft Foundation 54-Inch | EACH |

Payment is full compensation for furnishing testing equipment and performing CSL testing; evaluating and interpreting results; and for providing test reports.

The department will pay separately for furnishing and installing CSL access tubes under drilled shaft bid items in the contract.

## 29. Thermal Integrity Profiler (TIP) Testing, Drilled Shaft Foundation 54-Inch, Item SPV.0060.07.

### A Description

#### A.1 General

This special provision describes providing specialized equipment and trained testing personnel and to perform Thermal Integrity Profiler (TIP) testing of drilled shafts continuously during concrete placement and curing according to ASTM D7949 “Standard Test Methods for Thermal Integrity Profiling of Concrete Deep Foundations”, as the plans show, and as hereinafter provided. TIP testing is required the drilled shaft foundations for Structure B-10-398.

TIP testing records temperature of curing concrete (hydration energy) along the length of a drilled shaft to assess the quality of drilled shaft foundations hereinafter referred to as “drilled shafts”. Data will be acquired using Thermal Wires™, hereinafter referred to as “thermal wires”, tied to the reinforcement bar cage and installed prior to concreting. The expected temperature at any location is dependent on the shaft diameter, mix design, time of measurement and distance to the center of the shaft. TIP measurements are used to estimate the shape of the shaft along the length of the shaft. These estimates are compared with concreting logs to assess the overall quality of the shaft.

TIP testing can be performed using embedded thermal wires or using probes lowered into embedded tubes. This special provision specifies the thermal wire method.

#### A.2 TIP Testing Personnel Requirements

Provide a TIP testing expert to direct and perform all aspects of the TIP testing and provide interpretation of results. The TIP testing expert must be a professional engineer licensed in the State of Wisconsin. The TIP testing expert shall be employed by an independent testing agency with documented and approved experience in TIP testing. Submit the qualifications of the proposed TIP testing expert to the engineer for approval prior to beginning drilled shaft installation.

### B Materials

Provide a TIP testing data acquisition system consisting of multiple thermal wires embedded in the drilled shaft concrete to be TIP tested and connected to a computer-based data recorder. The data collection system shall be capable of automatically collecting temperature verses time after casting data along the length of the drilled shaft at intervals of 15 minutes. The thermal wires and TIP testing data acquisition system shall be as manufactured by:

Pile Dynamics Incorporated
30725 Aurora Road
Cleveland Ohio 44139
Phone: (216) 831-6131
Web Page: www.pile.com

Provide equipment with the following minimum requirements:

a. A computer-based TIP Data Acquisition System to monitor and download temperature versus time after casting.

b. Ability to automatically collect data at user defined time intervals (typically 15 minutes).

## C Construction

### C.1 TIP Testing Coordination

Schedule and coordinate drilled shaft construction with the TIP testing expert. Alter normal construction procedures as necessary to facilitate the TIP testing procedure. This includes providing suitable and safe access to the site and specific locations of drilled shafts to be tested and providing assistance to the TIP expert to facilitate the TIP testing.

### C.2 Thermal Wire Installation

Install thermal wires as shown in the plans the full length of drilled shafts and according to the procedures and recommendations of the TIP expert. For the initial installation of thermal wires in the contract, the TIP expert shall be on site to provide guidance and training on the installation and hookup of the thermal wires.

For the drilled shafts indicated on the plans to be TIP tested, install the number of thermal wires that is equal to or greater than the shaft diameter. For example, a drilled shaft diameter of 4.5 feet shall have minimum 5 thermal wires evenly spaced around the perimeter of the reinforcement cage and as shown in the plans. The minimum number of thermal wires for any shaft diameter shall be 5.

Align and attach the thermal wires to the main longitudinal reinforcement of the drilled shaft spaced approximately equally around the perimeter of the drilled shaft reinforcement cage. Stretch the thermal wires to minimize the wire slack and tie vertically at a maximum of every 3 feet to the main longitudinal reinforcement. Locate the thermal wire on the main longitudinal reinforcement bar such that it is 90º to the line connecting the reinforcement to the center of the shaft.

Extend the TIP wires from the bottom of the drilled shaft to at least 3 feet above the top of the drilled shaft, or 2 feet above the ground or water surface, whichever is higher, for shafts with cut-off below the ground surface. TIP wires extending beyond the top of the drilled shaft shall be attached to a CSL tube or similarly rigid support at frequent and regular intervals. Connect the thermal wires to the Thermal Access Port, acquire and analyze data as detailed in this special provision.

### C.3 TIP Testing

Connect the thermal wires to a Thermal Access Port (TAP) prior to or immediately following drilled shaft concrete placement. Care shall be taken to record the position of each cable in the cage by serial number. The exact timing and duration of data measurement will be determined by the contractor's TIP testing expert. Collect data at time intervals of 15 minutes for the duration of time sufficient to reach and record the peak heat of hydration temperature, but for a minimum of 48 hours or longer minimum duration as recommended by the TIP expert or as directed by the engineer. After completion of the data collection period, connect the TAP to the main TIP data acquisition unit and download the data files for inspection and evaluation of temperatures versus time for depth along the length of the drilled shaft.

Potential local defects indicated by locally low temperatures relative to the average temperature at that depth, or average temperatures significantly lower than the average temperatures at other depths, shall be immediately reported to the engineer.

### C.4 TIP Testing Reports

Within five working days of completion of TIP testing and receipt of shaft construction record, submit a TIP Testing Report for each drilled shaft tested to the engineer, summarizing TIP testing results. At a minimum the TIP testing reports must include:

1. Shaft-specific construction information (e.g., elevations of the top of shaft, bottom of casing, bottom of shaft, etc.) should be noted on all pertinent graphical displays so that the temperature plots are adjusted for end effects.
2. Graphical displays of temperature measurements in each thermal wire versus depth at peak temperature.

3. Indication of unusual temperatures, particularly significantly cooler local deviations of the average at any depth from the overall average over the entire length, in either probe or thermal wire measurements.
4. The overall average temperature at peak temperature. This temperature is proportional to the average radius computed from the actual total concrete volume installed. Radius at any point can then be determined from the temperature at that point compared to the overall average temperature.
5. A depiction of the shaft radius vs. depth including the concrete cover at peak temperature. Variations in temperature between wires (at each depth) which in turn correspond to variations in cage alignment should be noted.
6. The cage alignment or offset from center should be noted.
7. Conclusions or recommendations concerning the acceptability of the drilled shaft based on the interpretation of the TIP testing results obtained.

**D Measurement**

The department will measure Thermal Integrity Profiler (TIP) Testing pay items by the unit for each drilled shaft tested, acceptably completed, regardless of the number of thermal wire strings in the shaft.

**E Payment**

The department will pay for measured quantities at the contract unit price under the following bid item:

| ITEM NUMBER | DESCRIPTION | UNIT |
|---|---|---|
| SPV.0060.07 | Thermal Integrity Profiler (TIP) Testing, Drilled Shaft Foundation 54-Inch | EACH |

Payment is full compensation for furnishing and installing the thermal wires and data collection unit; evaluating and interpreting results; and for providing test reports.

## 30. Drilled Shaft Foundation 54-Inch, Item SPV.0090.03.

**A Description**

This special provision describes installing drilled foundation shafts for bridge foundations as shown on the plans.

Do not start work on any drilled foundation shafts until acceptance of the Drilling Contractor Qualification submittal and the acceptance of the Drilled Foundation Shaft Installation Plan.

**A.1 Qualifications of the Contractor**

**A.1.1 Drilling Contractor Qualification Submittal**

Submit the drilling contractor's qualifications, staff experience records, and equipment cut sheets and descriptions that will perform the work in this special provision at the preconstruction meeting or 21 calendar days prior to the start of drilled shaft construction, whichever date is earlier. The engineer will accept or reject the drilling contractor's qualifications, staff experience records, and equipment descriptions within 7 calendar days after receipt of the submission.

The drilling contractor performing the work described in these special provisions must have drilled foundation shaft project(s) successfully completed similar to those that the plans show using equipment meeting the requirements in subsection B.2 within the last five years. Submit a list outlining the drilling contractor's experience on at least five projects where they have successfully completed drilled foundation shaft construction, including one project completed within the last five years. A separate shaft project is defined as a project with at least 120 linear feet of total shaft length. Include in the project experience at least one project completed in soil and groundwater conditions similar to that anticipated for this project. Include in the project experience advancing drilled shafts with a shaft size at least as large as the plans show to a depth of at least 30 feet below the original ground surface. Show in at least one project evidence of permanence with a five-year minimum age. Include in the project experience documentation for each project a brief project description, detail the size of the shafts, construction methods used during installation, methods used for

shaft stabilization, local soil conditions, actual construction time and contact information consisting of an individual's name and current phone number. Contacts must be capable of verifying project participation.

### A.1.2 Staff Experience

Submit contractor staff experience records of the on-site engineer, on-site supervisors, crew chiefs and drill operators, who will be assigned to the project. Provide for each staff record a summary of each individual's experience that is complete enough for the engineer to determine whether each individual has satisfied the following qualifications. Do not use consultants or manufacturer's representatives in order to meet the requirements of this section.

- On-site engineer - Assign an individual as principal in charge and the contractor's main contact who has at least five years of drilled shaft experience, at least one year of which is as an employee of the contractor in good standing, and who has completed at least one successful drilled foundation shaft project using a shaft size at least as large as the plans show.
- On-site supervisor - Assign an individual to supervise the work who has at least five years of drilled shaft experience, at least one year of which is as an employee of the contractor in good standing, and who has completed at least three successful drilled foundation shaft projects using shaft sizes at least as large as the plans show. Include at least one project completed in soil and groundwater conditions similar to those anticipated for this project.
- Crew chiefs and drill operators - Assign crew chiefs and drill operators who have at least five years of drilled shaft experience using equipment meeting the requirements in subsection B.2, at least one year of which is as an employee of the contractor in good standing. Include at least one project completed in soil and groundwater conditions similar to those anticipated for this project.

List, as a minimum for each of the above individuals, three references of owners or engineers familiar with their work and provide address, phone, and e-mail contact information for each reference.

### A.1.3 Equipment Requirements

Submit equipment cut sheets and descriptions to perform the work in this special provision that meet the requirements in subsection B.2.

### A.2 Substitutions

The contractor may submit his own organization, staff and equipment to fulfill the requirements of subsections A.1.1, A.1.2, and A.1.3, as the drilling contractor or he may sublet to subcontractor. However, the organization approved that fulfills the requirements of subsection A.1.1 shall be the organization that performs the work in this special provision.

Request in writing to the engineer to provide substitute drilling contractor, staff or equipment not identified in the contractor's accepted drilling contractor qualification submittal. Substitute drilling contractor, staff or equipment must be equivalently or better qualified as determined by the engineer. Provide the experience and qualification information for the proposed substitute drilling contractor, staff or equipment as was originally provided in the drilling contractor's qualification submittal. The substitute drilling contractor, staff or equipment will not be permitted to start or continue any drilled foundation shaft work until the engineer confirms their qualifications and accepts the proposed drilling contractor, staff or equipment to work on the project.

Expect suspension by the engineer of drilled foundation shaft work if the contractor substitutes unqualified drilling contractor for accepted drilling contractor, unqualified personnel for accepted personnel, or unqualified equipment for accepted equipment, during construction. If work is suspended due to the substitution of unqualified drilling contractor, personnel, or equipment, the adjustment in contract time resulting from the suspension of work will not be allowed.

## B Materials

### B.1 General

Concrete, drilling fluid, reinforcement and formwork shall be in accordance to the requirements of QMP Drilled Shafts, standard specifications, as shown on the plans, and as hereinafter provided.
In the event that the provisions of other specification clauses cause ambiguity or conflict with these special provisions, the stricter requirement shall apply unless otherwise accepted by the engineer.

**B.2 Equipment**
Equipment used for excavation, drilling, and cleaning operations shall have adequate capacity including power, torque, and down thrust to excavate a hole to a depth equal to the maximum depth of the drilled shafts shown in the plans plus 15 feet, or plus 20 percent of their maximum depth, whichever is greater. Anticipate and make available at the job site all equipment necessary and essential to penetrate soft and hard soils, as well as obstructions, during the construction of the drilled shafts.

Where hard soils, or other material including natural or man-made obstructions are encountered and cannot be drilled using conventional earth or rock augers, drilling buckets, and/or over reaming tools; provide drilling equipment including, but not limited to rock core barrels, rock tools, down the hole hammers, chisels, air tools, or any other equipment necessary to construct the drilled shaft excavation to the depth and size as shown on the plans.
When applicable, or required by the engineer, provide equipment that produces a stable slurry suspension, mechanical agitation, and a pipeline or other safe methods of transporting the slurry to the drilled shaft and means of removing slurry for recovery and recirculation.

**B.3 Casing**

**B.3.1 Left-In-Place Casing**
Left-in-place casing shall be steel that minimally conforms to ASTM A36. Substitution of steel material with properties meeting or exceeding ASTM A36 may be used if approved by the engineer. Supply casing of the minimum length to achieve the length shown on the plans. Left-in-place casing shall be rigid, smooth, clean, watertight, and of ample strength to withstand both handling and installation stresses and the pressure of both concrete and the surrounding earth materials. The outside diameter of casing shall not be less than the specified size of the drilled shaft. All casing diameters shown on the plans refer to O.D. dimensions.
If a temporary casing is used in addition to a left-in-place casing, any annular spacing between the casings shall be filled with grout.

**B.4 Reinforcing Steel and Spacers**
Deformed reinforcing bars shall comply with the size, dimension, spacing, and details shown on the plans. In addition, they shall conform to AASHTO M31, Grade 60, and all the pertinent requirements of standard spec 505. Non-corrosive wheel type spacers and boots shall be used to properly position the reinforcing steel. All reinforcing steel shall be 100% wire tied between the vertical reinforcement and ties.

**B.5 Crosshole Sonic Logging (CSL) Tubes**
Access tubes for CSL testing shall be 2 inches I.D. schedule 40 steel pipe conforming to ASTM A 53, Grade A or B, Type E, F, or S. Pipes shall have a round, regular internal diameter, free of defects or obstructions; including any defect at the pipe joints, to permit the free unobstructed passage of source and receiver probes. Each tube or steel pipe shall be fitted with a watertight shoe onto the bottom and a removable cap at the top. Both, the shoe and cap shall be watertight and free from corrosion. The internal and external faces of the CSL tubes shall be clean to ensure passage of the probes and produce a good bond with the concrete.

Furnish neat cement grout for filling the access tubes at the completion of the CSL tests. Use grout that is a homogeneous mixture of water and Portland cement Type I/II or Type 1 L (MS). Do not exceed a water-cement ratio of 0.45. Provide grout with an unconfined compressive strength equal to the required compressive strength of the drilled shaft at 28 days when tested in accordance with ASTM C 1107.

**B.6 Template**

Provide a steel plate template at each drilled shaft foundation location to accurately locate and maintain the position of the shaft as shown on the plans. Provide concrete, reinforcement and formwork for the template according to the requirements of standard spec 501, 502 and 505 and as hereinafter provided.

**B.7 Thermal Integrity Profiler (TIP) Wires**
Install wires and provide other accessories described in bid item Thermal Integrity Profiler (TIP) Testing, Drilled Shaft Foundation 54-Inch elsewhere in these special provisions.

## C Construction

### C.1 Drilled Foundation Shaft Installation Plan

#### C.1.1 General
Prepare a Drilled Shaft Installation Plan and submit it at the preconstruction meeting or at least 30 calendar days prior to beginning drilled shaft foundation construction, whichever date is earlier. Submit the Drilled Shaft Installation Plan to the engineer for review. The engineer will accept the plan as submitted or return the plan with requested revisions. Do not start any drilled shaft installation until the engineer accepts the Drilled Shaft Installation Plan. Acceptance of the installation plan does not relieve the contractor of responsibility for successful completion of the drilled shafts.

#### C.1.2 Subsurface Conditions
The contractor is strongly advised to obtain and review the Geotechnical Exploration and Foundation Evaluation Report for the bridge structure for which the drilled foundation shafts are being constructed. The contractor is encouraged to consider rock core drilling described in subsection C.3.6.7 prior to excavation of shafts socketed into rock. If not completed already, the contractor shall complete test cores at each shaft to confirm rock conditions and tip depths. Account for rock variability described in the geotechnical report and construction schedule concerns in making this determination.

#### C.1.3 Submittals
The Drilled Foundation Shaft Installation Plan shall include the following:

a. **Job Site Visit**. Acknowledge that the job site was visited to verify the site conditions with regard to entrance, access, overhead lines, subsurface features, clearing and grubbing, permitting, and collecting all information necessary to plan and execute the installation of the drilled shafts.
b. **Plan to Protect Existing Structures**. Outline the steps to be taken during drilled shaft installation to protect adjacent or nearby structures and utilities.
c. **Details of Environmental Control Procedures**. Provide plan to prevent loss of slurry or concrete into waterways, project areas, or protected areas. Detail method to ensure the compliance with state and federal environmental regulations during drilled shaft construction.
d. **List of Proposed Equipment**. Include details of proposed templates; number and sizes of cranes; number and size of oscillators; number and sizes of drills, include rotary torque, crowd force drills, and maximum drilling depth; diameter, length, and reach of augers, bailing buckets, guide walls, templates, and roller bits; cleaning equipment including cleaning buckets, submersible pumps, or air-lifted pumps; size of de-sanding equipment and slurry pumps; soil/rock-coring sampling equipment; inspecting drilled shaft apparatus; length and diameter of tremie or size of concrete pumps; size, length, and thickness of casings; over reaming equipment; and all relevant equipment necessary to complete the drilled shaft installation. Acceptance of the installation plan by the department does not relieve the contractor responsibility to provide other equipment, if necessary, to achieve satisfactory shaft installations meeting the requirements of this special provision.
e. **Details of Sequence of Drilled Shaft Installation and Time for Construction Operations**. Include a layout of the drilled shaft installation sequence. Provide a sequential list of installation steps and a time table of operations for installing casing, sealing casing, excavation and/or drilling time, drilled shaft cleaning, rock coring, drilled shaft inspection, concrete placement. Consider the effect of construction operations of one drilled shaft onto the adjacent drilled shaft(s) and utilities and avoid construction conflicts that will affect the quality or integrity of the completed work. Indicate when and what construction sequence modifications shall be performed under atypical situations, i.e, weekend or holiday shutdowns, unanticipated shutdowns due to equipment issues, etc.

f. **Proposed Drilled Shaft Installation Procedure(s)**. Provide details of the proposed shaft installation procedures, including coring or drilling boulders, rock, obstructions or steep sloping surfaces, when required, and meeting the minimum installation requirements set forth in subsection C.3. Provide method for identification of the competent or bearing material before finalizing the excavation. Provide method for monitoring verticality of the drilled shaft walls during excavation, and details of proposed corrective measures to be implemented for shafts out of tolerance. Provide details of the methods and means of preventing displacement of the casing and/or drilled shaft during installation.
g. **Details of Slurry Operations.** Provide details of slurry type, methods to mix, circulate, de-sand, and test the slurry to comply with this special provision. Include details of procedures to prevent loss of slurry or concrete into waterways, sewers, and other areas to be protected. Provide slurry handling and disposal plan that complies with applicable state and federal regulations, as well as permit requirements.
h. **Inspection and Cleaning**. Provide methods to clean and inspect the drilled shaft excavation prior to reinforcement placement.
i. **Crosshole Sonic Logging (CSL).** Provide methods to install and secure the CSL pipes to the reinforcing cage or steel core, along with the proposed selection of pipe and size.
j. **Details of Reinforcement Steel Placement During Construction**. Include methods to ensure cage centering and cover; proper cage orientation, cage integrity while lifted during placement, number of cranes, number of lift points, and number of spreader bars; number and location of bottom and side spacers; cage support; and tie downs during concrete placement.
k. **Concrete Placement Plan**. The purpose of the Concrete Placement Plan is to ensure that a sufficient quantity of concrete is at the job site or in transit to the job site so that the entire pour can be done without delay. Include location of the concrete plant, number of trucks, estimated delivery times, estimated time between trucks, and number of trucks at the site before placement begins. Indicate the use of tremie or concrete pump lines and details of the seal to be used at the bottom end of the tremie or concrete pump line. Breakdowns of concrete plants, trucks, or traffic problems shall be considered under this Concrete Placement Plan. The contractor shall be aware of, and account for, batch, travel, and concrete placement times. Include an estimate of the concrete placement time per drilled shaft. When applicable, detail excavation to grade and finishing of the drilled shafts.
l. **Methods of Handling and Disposal of Spoil Excavation, Waste Slurry, Waste Concrete, and Drilled Shaft Cutoffs**. Present sufficient details to the engineer to evaluate the adequacy and compliance of the contractor's methods of disposal with the standard specifications, including all related environmental permits and local regulations.
m. **Other Information** requested on the plans or by the engineer.
n. **Reinforcing Steel Assembly and Installation Plan.** For shafts with a 4'-6" minimum nominal diameter and 40'-0" minimum length, prepare and submit the reinforcing steel assembly and installation plan. Reinforcing steel shop drawings, details of reinforcement placement, including bracing, centering, and lifting methods, and the method to assure the reinforcing cage position is maintained during construction, including use of bar boots and/or rebar cage base plates, and including placement of rock backfill below the bottom of shaft elevation shall comply with the pertinent requirements of the specifications.

   The reinforcing steel assembly and installation plan shall include:
   - Procedure and sequence of steel reinforcing bar cage assembly.
   - The tie pattern, tie types and tie wire gages for all ties on permanent reinforcing and temporary bracing.
   - Number and location of primary handling steel reinforcing bars used during lifting operations.
   - Type and location of all steel reinforcing bar splices.
   - Details and orientation of all internal cross-bracing, including a description of connections to the steel reinforcing bar cage.
   - Description of how temporary bracing is to be removed.
   - Location of support points during transportation.
   - Cage weight and location of the center of gravity.
   - Number and location of pick points used for lifting for installation, and for transport (if assembled off-site).

- Crane charts and a description and/or catalog cuts for all spreaders, blocks, sheaves and chockers used to equalize or control lifting loads.
- The sequence and minimum inclination angle at which intermediate belly rigging lines (if used) are released.
- Pick point loads at 0, 45, 60 and 90 degrees and at all intermediate stages of inclination where rigging lines are engaged or slackened.
- Methods and temporary supports required for cage splicing.
- For picks involving multiple cranes, the relative locations of the boom tips at various stages of lifting, along with corresponding net horizontal forces imposed on each crane.

**C.1.4 Acceptance**
The department will evaluate the Drilled Shaft Installation Plan for conformance with the requirements of these special provisions. Within 14 calendar days after receipt of the Drilled Shaft Installation Plan, the engineer will notify the contractor of the acceptance of the plan, or of additional information and/or changes required. Any unacceptable part of the Drilled Shaft Installation Plan will require resubmission. The contractor must resubmit the Drilled Shaft Installation Plan for evaluation and review with the necessary changes or additional information provided. The engineer will provide a written notice of acceptance or rejection of contractor's resubmitted Drilled Shaft Installation Plan within 14 calendar days after its receipt. The accepted contractor's Drilled Shaft Installation Plan will be subjected to trial and satisfactory performance in the field, and the engineer will grant final acceptance of the plan after its satisfactory field performance.
After assessment or reassessment of the Drilled Shaft Installation Plan has been made and the engineer has granted its acceptance, do not make any changes to the plan without written consent of the engineer.

**C.3 Drilled Shaft Installation**

**C.3.1 General**
Carry out the work in accordance to the accepted Drilled Foundation Shaft Installation Plan. The resulting installation plan shall include length of left-in-place casing, use of any temporary casing with grouting procedures, details of the constituent materials of any drilling fluid or means used for stabilization of the bottom of the excavation, the details of rock socket construction, the method of inspection, details of the concrete design mix, concreting method, the anticipated time to complete one shaft, and the pattern of construction.

Ensure that damage does not occur to the completed shafts through their working methods. Submit to the engineer a drilled shaft installation sequence. The proposed sequence and timing of shaft installation shall be such that the installation work shall not cause any damage to adjacent shafts. The shaft installation shall not commence until acceptance of the engineer has been obtained.

**C.3.2 Temporary Working Surface**
Use a temporary working surface to provide a level surface at the top of shafts for drilling where needed.

**C.3.3 Forcible Correction**
Where shafts have not been positioned within the specified limits no method of forcible correction will be permitted.

**C.3.4 Records**
Keep a record of all shafts installed. Give a copy of the record of the work done each day to the engineer within 24 hours of that day's work being completed. The engineer will accept the record form before drilled shaft works commence. Incorporate any comment by the engineer into the record form. Note all unexpected drilling or installation conditions in the records.

**C.3.5 Method of Drilled Shaft Installation**

**C.3.5.1 General**
The wet method shall be used to produce a sound and durable structure foundation free of defects.

Advance permanent casing through the unstable condition(s) and to the projected depth by twisting, drilling, or vibrating. Obtain prior approval from the engineer for vibrating the casing. After the casing is in place, excavate inside the casing to the projected shaft tip elevation using the wet excavation techniques described below. Clean the bottom of the excavation; test the drilling fluid for compliance with these special provisions, if applicable.

**C.2.5.2 Wet Method**

Use the wet installation method, or the casing installation method, for all drilled shaft locations. When using the wet method below the groundwater table, all drilled shaft operations shall be accomplished while maintaining a positive head of fluid above the water table.

When using the wet installation method, follow the following steps:

a. Drill the excavation and keep the drilled shaft always filled with fluid such as water, natural slurry, or slurry. Maintain a sufficient head of not less than 5 ft and maintain stability against heave and blow-in in the bottom of the excavation.
b. During excavation, test the properties of the fluid for compliance with these specifications, clean or desand the fluid as applicable.
c. Clean the bottom of the excavation with a bailing bucket, an airlift, a submersible pump, or other devices after the excavation is completed.
d. Just before lowering the reinforcing cage, test the fluid for conformance with the specifications.
e. Pour the concrete with a tremie pipe or a pump line extending to bottom of the excavated shaft to displace the fluid up and out of the shaft.

**C.3.6 Excavations**

**C.3.6.1 General**

Excavations required for the drilled shafts shall be performed through whatever materials encountered, of the dimensions and to the elevations shown in the plans, or as directed by the engineer. The excavation and installation method shall be suitable for the intended results and materials encountered. Blasting is not permitted.

Maintain a construction log during the drilled shaft excavation. Include on the construction log information such as ground elevation, groundwater elevation, sequence number, method of installation, machines and tools employed, drilling fluids employed, drilling times, excavated materials and their particular elevations, soil/rock-cores samples and their particular elevations, rock sockets and their elevation, bells plus their size and elevations, and all other information relevant to the excavation process that will assist the engineer in evaluating the foundation. Information shall also include proposed methods for disposal of excavated material and slurry conforming to state and local environmental regulations, codes and ordinances, the standard specifications, or as directed by the engineer.

**C.3.6.2 Protection of Existing Structures**

Take all reasonable precautions to prevent damage to existing structures and utilities. These measures shall include, but are not limited to, vibration monitoring or subsidence control during installation of casings, sheets, or drilling operations.

**C.3.6.3 Drilled Shaft Excavation**

Provide the necessary equipment to remove and dispose of all materials encountered in forming the drilled shaft excavation to the dimension and elevation as shown on the plans, or as directed by the engineer. Contractor's equipment may include, but are not limited to, augers and rotary drills. Unless otherwise shown on the plans, the drilled shaft excavations in overburden materials shall be vertical bored holes extending from the ground surface down to design tip elevation or the competent soil material, whichever is greater, where competent soil material is defined as the soil that will provide support and satisfactory performance to the structure.

In case of groundwater or severe seepage condition, with the flow of water very difficult to control, take appropriate measures including excavation with drilling fluid or excavation through a casing as indicated in the Drilled Shaft Installation Plan.

### C.3.6.4 Lost Tools

Drilling tools that are lost in the excavation shall not be considered obstructions and shall be promptly removed. All costs due to removal of lost tools shall be borne by the contractor including costs associated with hole degradation during removal operations or time while the hole remains open.

### C.3.6.5 Inspections and Cleanliness of Excavation

Provide the details of drilled shaft inspection and cleanliness within the Drilled Foundation Shaft Installation Plan, required by subsection C.1.3 of this specification. Provide equipment and tools for checking the dimensions and alignment of each drilled shaft excavation, and coordinate schedules for inspection of the excavation with the engineer. Determine dimensions, alignment, and final depth of the drilled shafts after final cleaning. When applicable, provide visual confirmation with a camera or safe access and egress to the engineer for inspection of the drilled shaft excavation prior to placement of the rebar cage and concrete. After the drilled shaft excavation has been prepared for inspection, notify the engineer. The cleanliness and the bearing surface of the drilled shafts will be evaluated and accepted by the engineer. Unless the engineer specifies otherwise, the contractor's cleaning operation shall be considered sufficient when no more that 50 percent of the bottom area of each shaft has less than 1/2-inch of sediment or debris at the time of hole acceptance just prior to steel positioning and concrete placement. The maximum depth of sediment or any debris at any location on the bottom of the shaft shall not exceed 1 1/2-inch at the time of concrete placement.

### C.3.6.6 Safety

Do not permit any worker to enter the drilled foundation shaft excavation for any reason unless a suitable casing has been installed, the water level has been lowered and stabilized below the level to be occupied, and suitable safety equipment and procedures have been provided to the personnel entering the excavation which includes OSHA certification for confined-entry-space.

### C.3.6.7 Test Core

At each drilled shaft, once the excavation is completed to the required minimum shaft embedment, clean the drilled shaft of any mud, loose soils and rock. Level the shaft bottom and eliminate any protuberance of rock into the limits of the shaft. Collect a test core of the rock (beginning at the drilled shaft base level) with a core diameter of not less than 2.125-inches (NQ core) and core length of not less than 10 feet and according to ASTM D2113.

The department will verify that this rock core has a recovery of at least 50 percent throughout the length cored. If the core does not meet the above requirements, extend the core as directed by the engineer. Subsequently, extend the drilled shaft embedment to the engineer-directed level.
Rock core drilling may be performed prior to excavation of the drilled shaft provided it is extended to the necessary depths and meets the recovery requirements outlined above or as directed by the engineer. The contractor is encouraged to review the geotechnical report listed in subsection C.1.2 in order to make this determination.

Competent bedrock is defined as bedrock having an overall core recovery of at least 90% and a rock quality designation (RQD) of at least 50%. After the shaft bearing level is established by the engineer, immediately grout the test core hole.

### C.3.6.8 Record Information

Provide to the department the drilled shaft excavation records and report any unusual observation to the engineer within 8 hours of discovery. Submit a draft of this form for each completed drilled shaft within 24 hours of shaft completion and submit the final form within 2 weeks. Submit relevant information on a daily basis, or more frequently when variations occur, or as otherwise required by the engineer.
Report the drilled shaft construction progress in accordance with “Records and Forms” Drilled Shafts: Publication No. FHWA-NHI 18-024, GEC 010 (September 2018), Chapter 15 and Appendix E.

### C.3.7 Placement of Reinforcing Steel Cage

Prior to placement of the reinforcing steel and concrete, if slurry fluid was employed during the installation of the drilled shaft, test the slurry for compliance with this specification as described in the QMP Drilled Shafts special provision. Slurry Tests shall be performed along the shaft and at the bottom of the shaft. Adjust the slurry properties as necessary to meet the specifications.
Prior to placement of the reinforcing steel and concrete, ensure that the C.3.6.5 cleanliness requirements are met.
Concrete or non-corrosive spacers shall be used at sufficient intervals not exceeding 10 feet along the reinforcement cage or the steel core. A minimum of 6 spacers shall be spaced evenly around the circumference of any shaft with a maximum space around the shaft circumference of 30 inches between any spacer (i.e. at any given level a 54-inch diameter shaft shall have 6 spacers). The first spacers shall be placed 1.5 feet from the bottom of the shaft with successive spacers at maximum intervals of 10 feet along the shaft. Spacers shall be of an appropriate diameter wheel to provide minimum clearance shown on the plans between the shaft excavation walls and the steel reinforcement.

**C.3.8 CSL Access Tube Installation**
Drilled shafts must be fitted with CSL test tubes to evaluate their integrity as shown on the plans.
Install the access tubes or pipes as nearly parallel and far as possible from the longitudinal bars. The number of tubes to be installed per each drilled shaft diameter is as indicated in the table below:

| Drilled Shaft Diameter | Number of CSL Tubes | Tube Spacing |
|---|---|---|
| 54-inches | 5 minimum | As shown on plans |

Securely attach the tubes to the interior of the reinforcement cage with a minimum concrete cover of three inches. The tubes may be attached to the exterior of the cage when accepted by the engineer provided the minimum cover requirement of 3-inches over the tubes shall be maintained. In all cases, the tubes shall be as near to vertical and parallel as possible.

Extend the tubes from the bottom of the drilled shaft to at least 3-feet above the top of the drilled shaft, or 2-feet above the ground surface for shafts with cut-off below the ground surface. The tubes must be watertight and capped to prevent concrete or debris from entering during manipulation of the cage and concreting. Care must be taken during lifting and lowering the steel reinforcement so as not to damage the tubes. Fill the CSL tubes with potable water prior to concrete placement. For production shafts and upon completion of the CSL tests, remove all the water from the access tubes or drilled holes and fill them with an approved grout.

**C.3.9 TIP Wire Installation**
Drilled shafts must be fitted with TIP wires to evaluate their integrity as shown on the plans. Install wires and provide other accessories described in bid item Thermal Integrity Profiler (TIP) Testing, Drilled Shaft Foundation 54-Inch included in these special provisions.

**C.3.10 Concrete Placement**

**C.3.10.1 General**
Do not prime pump within the drilled shaft. Place concrete continuously once concrete placement is started. No intermediate construction or cold joints are permitted within a single drilled foundation shaft.
Test the concrete delivered to the job site for compliance with the QMP Drilled Shafts special provisions, the standard specifications and these special provisions. Record the actual volume of concrete placed against the theoretical volume vs depth at depth intervals not exceeding the shaft diameter.
**C.3.10.2 Concrete Placement Time**

Ensure excavation inspection occurs no later than 24 hours after excavation is complete. Place concrete within three hours after excavation inspection and approval unless otherwise directed by the engineer. If the concrete is not placed within this time frame, the excavation must be re-inspected and accepted by the engineer prior to concrete placement.

**C.3.10.3 Concrete Placement by Free Fall**
Concrete placement within drilled shafts by free fall is not permitted.

**C.3.10.4 Concrete Placement by Tremie Pipes**
Use tremie pipes to place the concrete inside the excavation. Keep the discharge end of the tremie a minimum of 7-feet below the level of the fresh concrete already placed inside the excavation to maintain a seal. The concrete shall flow into position by pressure through a steel tremie with a minimum diameter of 10-inches. Seal the bottom of the tremie using one way flap valve, before it is lowered into the wet excavation. If water/slurry enters the tremie pipe after concrete pouring has started, the tremie must be withdrawn, cleaned, resealed, and pouring restarted. If for some reason, the tremie is raised out of the fluid concrete or the concrete inside the drilled shaft drops down contaminating the tremie, completely remove and clean the tremie, then replace the seal at the bottom of the tremie and lower the tremie back as far below as possible into the already placed concrete.

**C.3.10.5 Concrete Placement by Concrete Pumps**
Concrete pumps and concrete lines can be used to place concrete in drilled shafts rapidly or to deliver the concrete from a distant location. However, due to the need to disassemble the pump line to allow the removal of casing sections and potential air pockets, disruption in concrete flow, the concrete pump placement directly within the shaft is not permitted on this project. The pump must discharge the concrete into a minimum 10-inch diameter steel tremie with a bottom one way flap valve.

All pump lines and connections shall be watertight and must guide the concrete to the discharge point at the center of the rebar cage or steel core and drilled shaft excavation. The pump line may be flexible; however, inside the shaft use a minimum 10-inch diameter steel tremie pipe that can deliver the concrete in an uninterrupted manner. Keep the bottom of the tremie or discharge orifice 7-feet below the surface of fluid concrete already placed to avoid sudden jumping of the pump line out of the excavation. Concreting shall continue until over pouring is evident at the top of the drilled shaft and until dark gray concrete (acceptable concrete) can be distinguished from the drilling fluid.

**C.3.10.6 Casting Level**
Over pour concrete above the top of shaft cut-off level to ensure that all concrete at and below cut-off level is homogeneous and free of laitance and deleterious materials. Account for room and access requirements when cut-off level is below grade to adequately perform this task and protect adjacent ground from caving in.

**C.3.11 Construction Tolerances for Individual Shafts**
Drilled foundation shaft excavations or completed drilled foundation shafts constructed out of the tolerance will not be accepted. The contractor is responsible for correcting to the satisfaction of the engineer all unacceptable work. Materials, construction, work, engineering analysis, and redesign necessary to complete corrections to out-of-tolerance excavations or completed drilled shafts shall be furnished to the department without either cost or time extension for the project. Comply with the following construction tolerances:

a. The final, as constructed position of the drilled shaft shall be within a maximum of 2 inches in any direction from the theoretical position shown on the plans, unless otherwise permitted by the engineer prior to construction.
b. The vertical alignment of the drilled shaft excavation shall not vary by more than 1/16 inch per foot from plumb vertical.
c. The diameter of the installed drilled shaft shall not be less than the diameter of the drilled shaft shown on the plans. Any conflicts due to a casing that is greater in diameter than the plan shaft diameter shall be remedied by the contractor. No additional compensation or schedule time shall be granted to the contractor for resolving any conflicts due to oversized casings. Employ equipment and methods of excavation to complete the drilled shaft excavation to a planar bottom, and the cutting edges of the equipment used during the excavation shall be normal to equipment's vertical axis within a tolerance of 3/8-inch per foot. The bottom of the drilled shaft excavation shall be normal to the axis of the drilled shaft within ¾ inch per foot.
d. Tolerances outlined in sections a. to c. herein shall be checked and finally met by the contractor prior to placement of the reinforced rebar cage or steel core inside the shaft hole. Ensure the drilled shaft casing avoids conflicting with the reinforced rebar cage in adjacent shafts by ensuring that the provisions of C.3.10.b are never violated. If these provisions are violated, rectify the shaft in accordance with subsection C.3.12.

f. After the concrete is poured, the top elevation of the installed drilled shaft shall be within 1-inch of the top elevation of the corresponding drilled shaft on the plans, and the top of the reinforcing steel cage shall be within the positional tolerance shown on the plans. The center of the reinforcing cage shall be the center of the drilled shaft.

**C.3.12 Non Destructive Testing Program**

Perform CSL and TIP testing as specified elsewhere in the special provisions, and as directed by the engineer.

**C.3.13 Acceptance for Constructed Drilled Shafts**

**C.3.13.1 General**

Any drilled foundation shafts that are not constructed and installed in accordance to these special provisions will be rejected by the engineer. Rejected shafts shall be replaced or rectified by the contractor using methods and procedures subject to the acceptance of the engineer before beginning replacement or rectification. If required to rectify rejected shafts, shaft replacement, shaft repair, or the cost of constructing additional shafts, will be at no additional cost to the department and no additional time will be added to the contract.

In the event that a shaft or shafts are rejected, work on remaining drilled shafts in the contract cannot continue until the contractor re-visits and re-submits a revised drilled shaft installation plan and the revised plan is accepted by the engineer. The revised plan must address any construction issues that resulted in or contributed to the reason(s) for which the deficient shaft(s) were rejected. No additional time will be added to the contract for the time required to revise and accept the revised drilled shaft installation plan.

**C.3.13.2 Based on Specifications**

The department will only accept drilled foundation shafts that conform to these special provisions. Drilled foundation shafts and related work constructed in any manner that disregards any specified requirement will not be accepted. This includes:

a. Drilled foundation shaft excavations constructed out-of-tolerance, as specified in this specification. When repair to an out-of-tolerance shaft is possible as determined by the engineer, fix the drilled shaft to meet the tolerances before the contractor is permitted to proceed further with any drilled shaft construction. All repairs must be acceptable to the engineer before the contractor may resume the drilled shaft work.

b. Excavation of a drilled foundation shaft with slurry not conforming to the QMP Drilled Shafts special provision.

c. Drilled foundation shafts exhibiting cuttings from slurry at the drilled shaft bottom; showing soft, incomplete, or unclean bottoms; or presenting side sloughing and sedimentation at the bottom.

d. Drilled foundation shafts with honeycomb intrusions or concrete in which the fines have been washed out or water channels in concrete.

e. Horizontal discontinuity or necking in the drilled foundation shaft concrete.

f. Quarter-moon-shaped soil intrusions on the sides of a drilled foundation shaft.

g. Folded-in debris inside a drilled foundation shaft.

h. Drilled foundation shafts for which the mix design has been altered without the acceptance of the engineer, including the unauthorized addition of water to a mix design to bring it to a certain slump.

i. Drilled foundation shafts constructed in a manner where concrete placement has failed to meet the required time requirements, placement tolerances, or the methods of installation did not have the engineer’s acceptance.

j. Drilled foundation shafts constructed with concrete not meeting the minimum 28-day compressive strength requirement shown on the plans.

**C.3.13.3 Based on the CSL or TIP Tests**

Reports for the various tests performed elsewhere in the special provisions will be reviewed by the engineer. If the reports indicate significant anomalies or defects, the engineer will direct the contractor to core the shaft(s) at the location(s) of the defect or anomaly. The coring shall be a minimum of NX sized double tube core barrel. The engineer will determine the number of cores, length(s), location(s), and testing methodology. If the coring or core sample testing results confirm the presence of significant anomalies or defects, the drilled shaft will be determined to be unacceptable and rejected by the engineer. Upon rejection of the shaft(s), submit a remedial action plan to the engineer for correcting the rejected work. The remedial action plan shall include detailed shaft repair or replacement procedures if necessary and will be subject to acceptance by the engineer. Any modifications to the drilled shaft, load transfer mechanisms, and elements affected by the proposed remedial actions will require calculations and working drawings and shall be made and stamped by a professional engineer, registered in the state of Wisconsin.

In the event that the engineer directs the contractor to core through the concrete and the coring and associated core sample tests confirm the presence of anomalies or defects, the cost of coring, hole closure, core sample tests, and all labor and materials to perform the accepted remedial actions shall be provided at no additional cost to the department and with no extension of the contract time originally granted.

In the event that the engineer directs the contractor to core through the concrete and the core or core sample tests do not confirm the presence of anomalies or defects, the cost of the coring, hole closure and associated testing shall be borne by the department.

Frequent defects as determined by the engineer will result in a re-evaluation of the contractor's installation procedure and, depending on the frequency and type of defect, the engineer may require the contractor to change or modify his procedure.

**D Measurement**

The department will measure Drilled Foundation Shaft (diameter) of individual shafts by the linear foot, acceptably completed. Longer shafts, larger shaft diameters, additional excavation, and additional concrete placed beyond the limits of the plan dimensions will not be measured for payment unless authorized and agreed to in advance of placement by the engineer.

**E Payment**

The department will pay for measured quantities at the contract unit price under the following bid item:

| ITEM NUMBER | DESCRIPTION | UNIT |
|---|---|---|
| SPV.0090.03 | Drilled Shaft Foundation 54-Inch | LF |

Payment is full compensation for preparing all submittals, including the Drilled Foundation Shaft Installation Plan; furnishing, and installing full depth permanent casing, templates, placing and removing temporary working surfaces, drilling fluids, documentation, clearing or removal of surface obstructions, clearing or removal of known man-made or natural obstructions; drilling the shafts, handling and disposal of the excavated, augered and cored soils, and any drilling fluids; lifting and positioning the reinforcement steel cage, including any required wheel type spacers, boots, internal bracing of the reinforcement steel cage, and any other temporary lifting supports; furnishing and placing the concrete for the Drilled Foundation Shafts to the dimensions and elevations as shown on the plans, including removal of over pour concrete; and furnishing, installing and closing the crosshole logging tubes.

Reinforcement bars are measured and paid under the bid item Bar Steel Reinforcement HS Bridges.

**Schedule of Items**
Attached, dated August 2, 2024, are the revised Schedule of Items Pages 1 – 7.

**Plan Sheets**
The following 8½ x 11-inch sheets are attached and made part of the plans for this proposal:
Revised: 20, 23, 76, 77, 78, 80, 81, 93-96

END OF ADDENDUM

## CLEARING & GRUBBING

| CAT. | | STATION | - | STATION | 201.0105 CLEARING STA | 201.0205 GRUBBING STA |
|---|---|---|---|---|---|---|
| 0010 | ROADWAY | 6+50 | - | 9+25 | 3 | 3 |
| 0010 | ROADWAY | 10+75 | - | 13+00 | 3 | 3 |
| **CATEGORY 0010 SUBTOTAL** | | | | | **6** | **6** |
| 0030 | RECREATIONAL LANE | 6+38 | - | 9+15 | 3 | --- |
| 0030 | RECREATIONAL LANE | 11+36 | - | 11+86 | 1 | --- |
| **CATEGORY 0030 SUBTOTAL** | | | | | **4** | **0** |
| **PROJECT TOTAL** | | | | | **10** | **6** |

## REMOVING GUARDRAIL

| CAT. | | STATION | - | STATION | OFFSET | 204.0165 REMOVING GUARDRAIL LF |
|---|---|---|---|---|---|---|
| 0010 | ROADWAY | 7+78 | - | 8+56 | RT | 79 |
| 0010 | ROADWAY | 7+80 | - | 8+56 | LT | 76 |
| 0010 | ROADWAY | 11+44 | - | 12+22 | RT | 78 |
| 0010 | ROADWAY | 11+44 | - | 12+21 | LT | 78 |
| **CATEGORY 0010 SUBTOTAL** | | | | | | 311 |
| **PROJECT TOTAL** | | | | | | **311** |

## EARTHWORK

| DIVISION | FROM/TO STATION | LOCATION | 205.0100 COMMON EXCAVATION (CY) (1) CUT (2) | 205.0100 COMMON EXCAVATION (CY) (1) EBS EXCAVATION (3) | SALVAGED/UNUSABLE PAVEMENT MATERIAL (4) | AVAILABLE MATERIAL (5) | UNEXPANDED FILL | EXPANDED FILL (13) FACTOR 1.25 | MASS ORDINATE +/- (14) | WASTE | 208.0100 BORROW (CY) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CTH G - WEST | 6+07.00/8+42.15 | | 210 | 0 | 70 | 140 | 1,979 | 2,474 | -2,334 | 0 | 2,334 |
| CTH G - EAST | 11+72.00/13+34.00 | | 222 | 0 | 53 | 169 | 94 | 118 | 52 | 52 | 0 |
| Cat. 0010 | SUBTOTAL COMMON EXC | | 432 | | 123 | 309 | 2,073 | 2,591 | -2,282 | 52 | 2,334 |
| | TOTAL COMMON EXC CAT. 0010 | | 432 | | | | | | | | 2,334 |
| CTH G - WEST REC LANE | 6+07.00/8+42.15 | | 0 | 0 | 0 | 0 | 1,086 | 1,358 | -1,358 | 0 | 1,358 |
| CTH G - EAST REC LANE | 11+72.00/13+34.00 | | 0 | 0 | 0 | 0 | 223 | 279 | -279 | 0 | 279 |
| Cat. 0030 | SUBTOTAL COMMON EXC | | 0 | | 0 | 0 | 1,309 | 1,636 | -1,636 | 0 | 1,636 |
| | TOTAL COMMON EXC CAT. 0030 | | 0 | | | | | | | | 1,636 |
| | PRJOECT TOTAL | | 432 | | | | | | | | 3,970 |

NOTES:
(1) COMMON EXCAVATION IS THE SUM OF THE CUT AND EBS EXCAVATION COLUMNS. ITEM NUMBER 205.0100
(2) SALVAGED/UNUSUABLE PAVEMENT MATERIAL IS INCLUDED IN CUT.
(4) SALVAGED/UNUSABLE PAVEMENT MATERIAL
(5) AVAILABLE MATERIAL = CUT - SALVAGED/UNUSUABLE PAVEMENT MATERIAL
(13) EXPANDED FILL FACTOR = 1.25
(14) THE MASS ORDINATE + OR - QTY CALCULATED FOR THE DIVISION. PLUS QUANTITY INDICATES AN EXCESS OF MATERIAL WITHIN THE DIVISION. MINUS INDICATES A SHORTAGE OF MATERIAL WITHIN THE DIVISION.
(15) FACTORS USED TO COMPUTE ANTICIPATED WASTE AND THE COMPUTED WASTE VOLUME IDENTIFIED ARE FOR GENERAL INFORMATION ONLY.

Addendum No. 01
ID 7840-03-73
Revised Sheet 20
August 2, 2024

## EROSION CONTROL MOBILIZATION

| CATEGORY | | 628.1905 MOBILIZATIONS EROSION CONTROL EACH | 628.1910 MOBILIZATION EMERGENCY EROSION CONTROL EACH |
|---|---|---|---|
| 0010 | ROADWAY | 2 | 1 |
| **CATEGORY 0010 SUBTOTAL** | | **2** | **1** |
| 0030 | RECREATIONAL LANE | 1 | 1 |
| **CATEGORY 0030 SUBTOTAL** | | **1** | **1** |
| **PROJECT TOTAL** | | **3** | **2** |

## EROSION CONTROL

| CAT. | | STATION | - | STATION | OFFSET | 628.1504 SILT FENCE LF | 628.1520 SILT FENCE MAINTENANCE LF | 628.6005 TURBIDITY BARRIERS SY | 628.7570 ROCK BAGS EACH |
|---|---|---|---|---|---|---|---|---|---|
| 0010 | ROADWAY | 5+80 | - | 8+80 | RT/LT | 670 | 670 | --- | --- |
| 0010 | ROADWAY | 10+75 | - | 13+40 | RT/LT | 480 | 480 | --- | --- |
| 0010 | ROADWAY | 8+80 | - | 10+05 | RT/LT | --- | --- | 420 | --- |
| 0010 | ROADWAY | 10+25 | - | 11+30 | RT/LT | --- | --- | 370 | --- |
| **CATEGORY 0010 TOTAL** | | | | | | **1,150** | **1,150** | **790** | **0** |
| 0030 | RECREATIONAL LANE | 6+75 | - | 8+80 | LT | 300 | 300 | --- | --- |
| 0030 | RECREATIONAL LANE | 10+75 | - | 13+40 | LT | 250 | 250 | --- | --- |
| 0030 | RECREATIONAL LANE | 8+50 | - | | LT | --- | --- | --- | 15 |
| 0030 | RECREATIONAL LANE | 9+00 | - | | LT | --- | --- | --- | 15 |
| 0030 | RECREATIONAL LANE | 10+75 | - | 13+40 | LT | 250 | 250 | --- | --- |
| **CATEGORY 0030 TOTAL** | | | | | | **800** | **800** | **0** | **30** |
| **PROJECT TOTAL** | | | | | | **1,950** | **1,950** | **790** | **30** |

## PERMANENT SIGNING

| CAT. | | STATION | OFFSET | SIGN MESSAGE | SIGN CODE | SIZE IN X IN | 634.0814 POSTS TUBULAR STEEL 2x2-INCH 14-FT EACH | 637.2210 SIGNS TYPE II REFLECTIVE H SF | 638.2102 MOVING SIGNS TYPE II EACH | 638.2602 REMOVING SIGNS TYPE II EACH | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0010 | ROADWAY | 7+95 | RT | WEIGHT LIMIT 20 TONS | R12-1 | X | --- | --- | --- | 1 | SAME POLE |
| 0010 | ROADWAY | 7+95 | RT | ATV 10 MPH | -- | X | --- | --- | 1 | --- | |
| 0010 | ROADWAY | 7+98 | LT | 13'-6" CLEARANCE | W12-2 | X | --- | --- | --- | 1 | |
| 0010 | ROADWAY | 8+10 | RT | SPEED LIMIT 30 | R2-1 | 24 X 30 | 1 | 5.00 | 1 | --- | |
| 0010 | ROADWAY | 8+35 | RT | ATV ROUTE CITY OF GREENWOOD | -- | X | --- | --- | 1 | --- | SAME POLE |
| 0010 | ROADWAY | 8+35 | RT | NO FISHING FROM BRIDGE | R9-55 | X | --- | --- | --- | --- | |
| 0010 | ROADWAY | 8+55 | LT | BRIDGE HASH MARKS | W5-52L | X | --- | --- | 1 | --- | |
| 0010 | ROADWAY | 8+55 | RT | BRIDGE HASH MARKS | W5-52R | X | --- | --- | 1 | --- | |
| 0010 | ROADWAY | 11+45 | LT | BRIDGE HASH MARKS | W5-52L | X | --- | --- | 1 | --- | |
| 0010 | ROADWAY | 11+45 | RT | BRIDGE HASH MARKS | W5-52R | X | --- | --- | 1 | --- | |
| 0010 | ROADWAY | 11+67 | LT | NO FISHING FROM BRIDGE | R9-55 | X | --- | --- | 1 | --- | |
| 0010 | ROADWAY | 11+67 | LT | ATV/UTV ROUTE | -- | X | --- | --- | 1 | --- | SAME POLE |
| 0010 | ROADWAY | 11+67 | LT | ATV/SNOWMOBILE 10 MPH | -- | X | --- | --- | --- | --- | |
| 0010 | ROADWAY | 12+08 | LT | WEIGHT LIMIT 20 TONS | R12-1 | X | --- | --- | --- | 1 | |
| 0010 | ROADWAY | 12+08 | RT | 13'-6" CLEARANCE | W12-2 | X | --- | --- | --- | 1 | |
| **CAT. 0010 SUBTOTAL** | | | | | | | **1** | **5.00** | **9** | **4** | |
| 0030 | RECREATIONAL LANE | 11+67 | LT | SNOWMOBILE SPEED LIMIT 10 | -- | X | --- | --- | 1 | --- | |
| **CAT. 0030 SUBTOTAL** | | | | | | | **0** | **0.00** | **1** | **0** | |
| **PROJECT TOTAL** | | | | | | | **1** | **5.00** | **10** | **4** | |

Addendum No. 01
ID 7840-03-73
Revised Sheet 23
August 2, 2024

Addendum No. 01
ID 7840-03-73
Revised Sheet 76
August 2, 2024

## BENCH MARK

| NO. | STATION | DESCRIPTION | ELEV. |
|---|---|---|---|
| BM 2 | 8+56.90, 15.18' RT | EXISTING BRIDGE SW WING | 1124.85 |

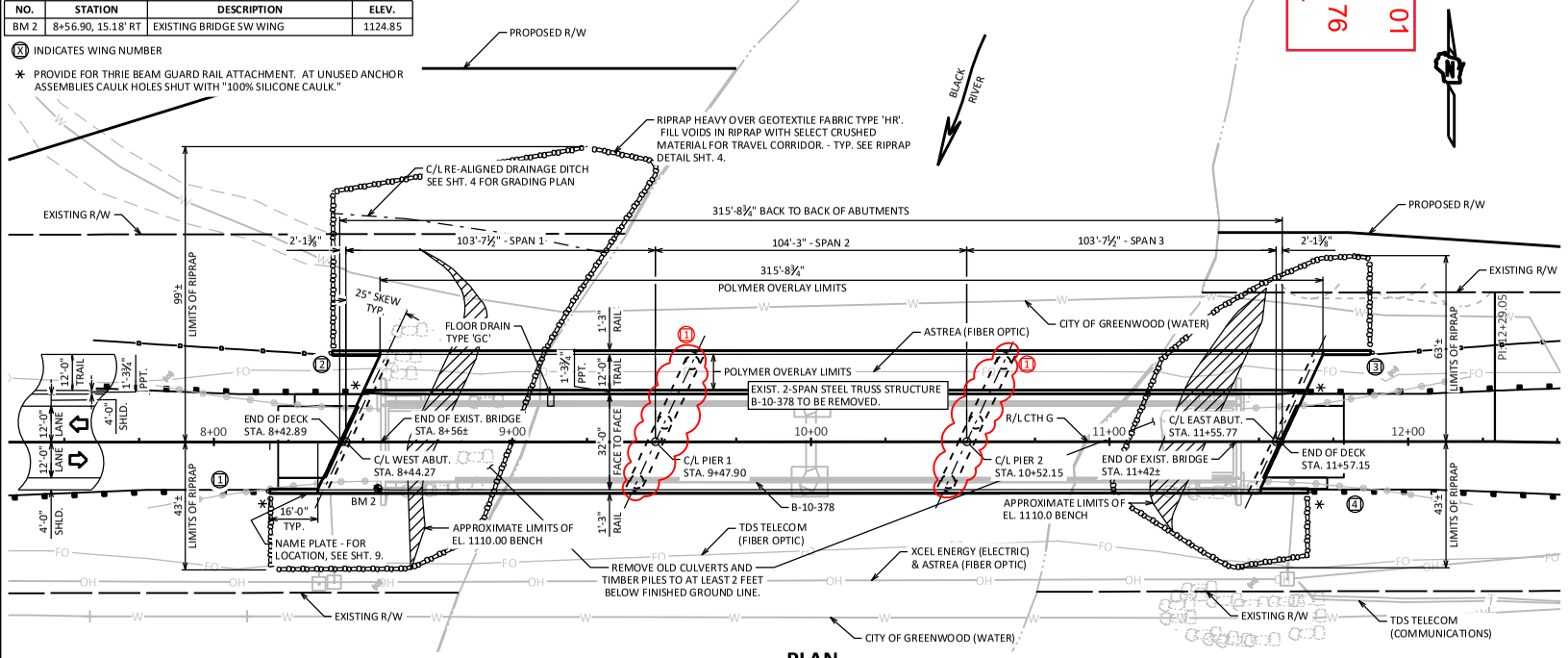
(X) INDICATES WING NUMBER

* PROVIDE FOR THRIE BEAM GUARD RAIL ATTACHMENT. AT UNUSED ANCHOR ASSEMBLIES CAULK HOLES SHUT WITH "100% SILICONE CAULK."

STATE PROJECT NUMBER
**7840-03-73**

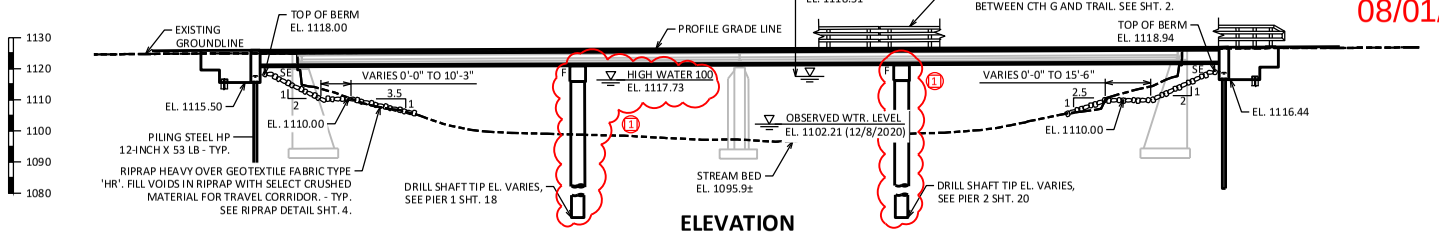
## LIST OF DRAWINGS:






## PLAN

3-SPAN 45W" PRESTRESSED GIRDERS




## ELEVATION

(LOOKING UPSTREAM)

SDR
08/01/24

WISCONSIN
JAMES A. RHOAD-DROGALIS
E-47302
MADISON
WI
7/30/2024
PROFESSIONAL ENGINEER

| NO. | DATE | REVISION | BY |
|---|---|---|---|
| 1 | 07/24 | COLUMN & SHAFT DIAMETER | UD |

## DESIGN DATA

**LIVE LOAD:**

DESIGN LOADING: HL-93
INVENTORY RATING: RF = 1.11
OPERATING RATING: RF = 1.58
WISCONSIN STANDARD PERMIT VEHICLE (WIS-SPV): 250 (KIPS)

STRUCTURE IS DESIGNED FOR A FUTURE WEARING SURFACE OF 20 POUNDS PER SQUARE FOOT.

**MATERIAL PROPERTIES:**

CONCRETE MASONRY:
SUPERSTRUCTURE & STRUCTURAL APPROACH SLAB — $f'_c$ = 4,000 PSI
ALL OTHER — $f'_c$ = 3,500 PSI

BAR STEEL REINFORCEMENT
GRADE 60 — $f_y$ = 60,000 PSI

45W" PRESTRESSED GIRDERS:
CONCRETE MASONRY — $f'_c$ = 8,000 PSI
STRANDS: 0.6" DIA. WITH ULTIMATE TENSILE STRENGTH OF 270,000 P.S.I.

## FOUNDATION DATA

ABUTMENTS TO BE SUPPORTED ON HP 12-INCH X 53 LB PILING (WITH PILE POINTS) DRIVEN TO A REQUIRED DRIVING RESISTANCE OF 210 TONS ** PER PILE AS DETERMINED BY THE MODIFIED GATES DYNAMIC FORMULA. ESTIMATED 35'-0" LONG.

**THE FACTORED AXIAL RESISTANCE OF PILES IN COMPRESSION USED FOR DESIGN IS THE REQUIRED DRIVING RESISTANCE MULTIPLIED BY A RESISTANCE FACTOR OF 0.5 USING MODIFIED GATES TO DETERMINE PILE CAPACITY.

PIERS CONSISTING OF DRILLED SHAFTS TO BE SUPPORTED ON SOUND ROCK WITH A MINIMUM FACTORED END BEARING RESISTANCE OF 150,000 PSF***. A GEOTECHNICAL ENGINEER WILL DETERMINE THE MINIMUM FACTORED RESISTANCES BY VISUAL INSPECTION PRIOR TO CONSTRUCTION OF THE DRILLED SHAFTS.

***THE FACTORED BEARING RESISTANCE IS THE VALUE USED FOR DESIGN.

## HYDRAULIC DATA

(1)

**100-YEAR FREQUENCY:**
$Q_{100}$= 33,000 C.F.S.
$V_{100}$= 8.8 F.P.S.
$HW_{100}$= EL 1117.73
WATERWAY AREA = 3759 SQ. FT.
DRAINAGE AREA = 527 SQ. MI.
ROADWAY OVERTOPPING = N/A
SCOUR CRITICAL CODE = 5

**2-YEAR FREQUENCY:**
$Q_2$= 8990 C.F.S.
$V_2$= 4.8 F.P.S.
$HW_2$= EL. 1109.39

## TRAFFIC DATA

**FEATURE ON CTH G:**
ADT = 1430 (2023)
ADT = 1570 (2043)
R.D.S. = 30 MPH

**STRUCTURE DESIGN CONTACTS:**

BUREAU OF STRUCTURES:
AARON BONK (608) 261-0261

CONSULTANT
JAMES RHOAD-DROGALIS (608) 828-8166

AECOM

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

ACCEPTED _____ _____
CHIEF STRUCTURES DESIGN ENGINEER DATE

**STRUCTURE B-10-398**

CTH G OVER BLACK RIVER

| COUNTY | CITY |
|---|---|
| CLARK | GREENWOOD |

DESIGN SPEC.
AASHTO LRFD BRIDGE DESIGN SPECIFICATION

| DESIGNED BY | DESIGNED CK'D | DRAWN BY | PLANS CK'D |
|---|---|---|---|
| DCH | JRD | DCH | JRD |

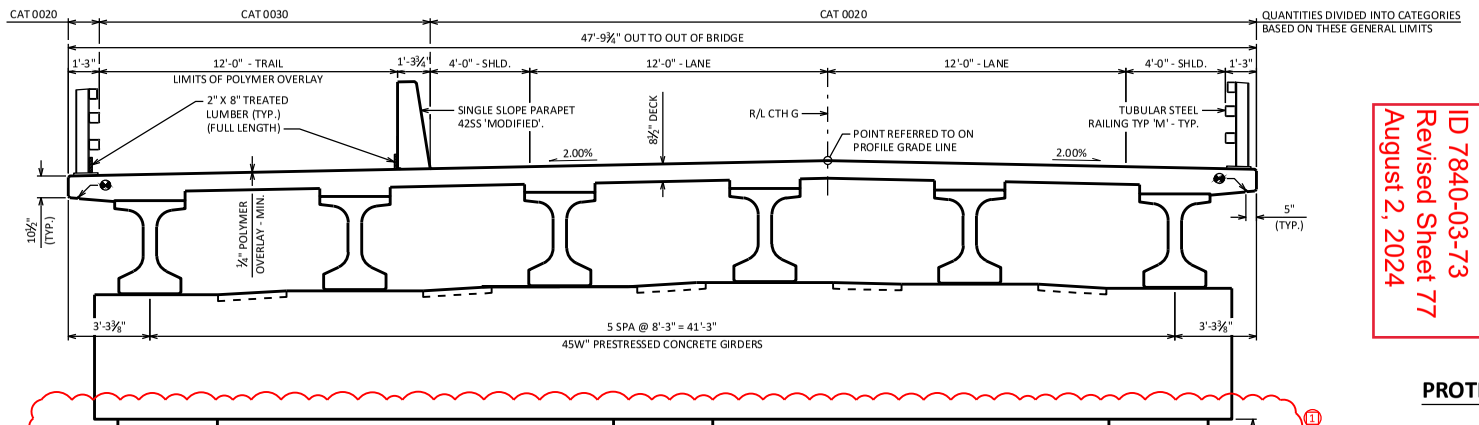
**GENERAL PLAN & ELEVATION**

SHEET 1 OF 33
76

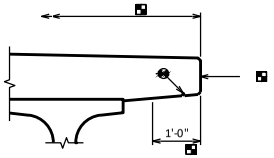
I.D. 7840-03-03 DATE: APR 2024

SCALE =

| STATE PROJECT NUMBER |
|---|
| 7840-03-73 |

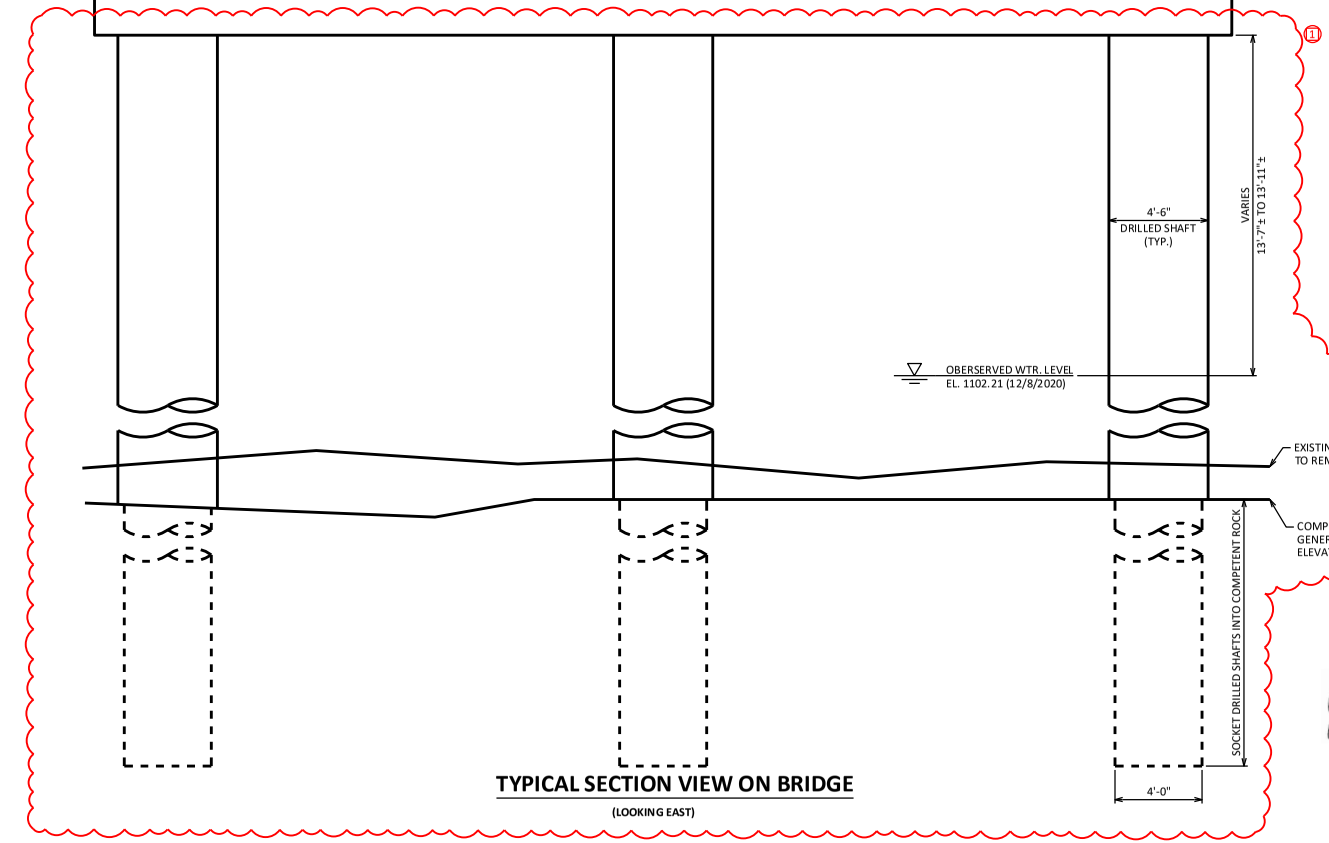



Addendum No. 01
ID 7840-03-73
Revised Sheet 77
August 2, 2024



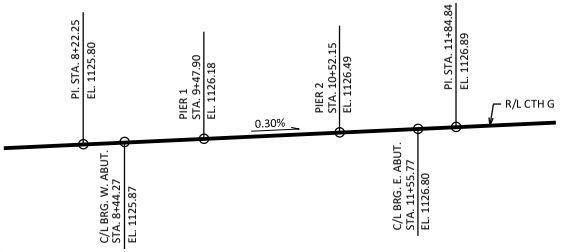

## PROTECTIVE SURFACE TREATMENT DETAIL

(DECK REINFORCEMENT NOT SHOWN)




## TYPICAL SECTION VIEW ON BRIDGE

(LOOKING EAST)




## PROFILE GRADE LINE - CTH G

SDR

08/01/24

## NOTES

1. ¾" V-GROOVE REQ'D. EXTEND TO 6" FROM F.F. OF ABUTMENT DIAPHRAGM.
2. PROTECTIVE SURFACE TREATMENT SHALL BE APPLIED TO THE TOP, SIDE AND BOTTOM OF DECK AS SHOWN.

WISCONSIN
JAMES A. RHOAD-DROGALIS
E-47302
MADISON
WI
7/29/2024
PROFESSIONAL ENGINEER

| NO. | DATE | REVISION | BY |
|---|---|---|---|
| 1 | 07/24 | COLUMN & SHAFT DIAMETER | UD |

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

**STRUCTURE B-10-398**

DRAWN BY DCH | PLANS CK'D JRD

**CROSS SECTION**

SHEET 2 OF 33

77

SCALE =

8

8

| STATE PROJECT NUMBER |
|---|
| 7840-03-73 |

## TOTAL ESTIMATED QUANTITIES

| BID ITEM NUMBER | BID ITEMS | UNIT | SUPER | WEST ABUT. | PIER 1 | PIER 2 | EAST ABUT. | TOTALS | CATEGORY 0020 | CATEGORY 0030 |
|---|---|---|---|---|---|---|---|---|---|---|
| 203.0250 | REMOVING STRUCTURE OVER WATERWAY REMOVE DEBRIS B-10-0378 | EACH | --- | --- | --- | --- | --- | 1 | 1 | --- |
| 206.1001 | EXCAVATION FOR STRUCTURES BRIDGES B-10-0398 | EACH | --- | --- | --- | --- | --- | 1 | 1 | --- |
| 210.1500 | BACKFILL STRUCTURE TYPE A | TON | --- | 320 | --- | --- | 320 | 640 | 460 | 180 |
| 502.0100 | CONCRETE MASONRY BRIDGES | CY | 578.4 | 51.7 | 67.9 | 68.5 | 51.5 | 818 | 555 | 263 |
| 502.3200 | PROTECTIVE SURFACE TREATMENT | SY | 1775 | 25 | --- | --- | 25 | 1825 | 1361 | 464 |
| 502.3210 | PIGMENTED SURFACE SEALER | SY | 274 | --- | --- | --- | --- | 274 | --- | 274 |
| 503.0146 | PRESTRESSED GIRDER TYPE I 45W-INCH | LF | 1872 | --- | --- | --- | --- | 1872 | 1248 | 624 |
| 505.0400 | BAR STEEL REINFORCEMENT HS STRUCTURES | LB | --- | 3150 | 30260 | 25360 | 3150 | 61920 | 44011 | 17909 |
| 505.0600 | BAR STEEL REINFORCEMENT HS COATED STRUCTURES | LB | 149280 | 2150 | --- | --- | 2150 | 153580 | 104344 | 49236 |
| 506.2605 | BEARING PADS ELASTOMERIC NON-LAMINATED | EACH | 36 | --- | --- | --- | --- | 36 | 24 | 12 |
| 506.4000 | STEEL DIAPHRAGMS B-10-0398 | EACH | 30 | --- | --- | --- | --- | 30 | 18 | 12 |
| 509.5100.S | POLYMER OVERLAY | SY | 421 | --- | --- | --- | --- | 421 | --- | 421 |
| 513.4061 | RAILING TUBULAR TYPE M | LF | 632 | 34 | --- | --- | 34 | 700 | 700 | --- |
| 514.0445 | FLOOR DRAIN TYPE GC | EACH | 1 | --- | --- | --- | --- | 1 | --- | 1 |
| 514.2625 | DOWNSPOUT 6-INCH | LF | 4 | -- | -- | -- | -- | 4 | -- | 4 |
| 516.0500 | RUBBERIZED MEMBRANE WATERPROOFING | SY | --- | 12 | --- | --- | 12 | 24 | 19 | 5 |
| 550.0500 | PILE POINTS | EACH | --- | 10 | --- | --- | 10 | 20 | 16 | 4 |
| 550.1120 | PILING STEEL HP 12-INCH X 53 LB | LF | --- | 350 | --- | --- | 350 | 700 | 560 | 140 |
| 606.0300 | RIPRAP HEAVY | CY | --- | 389 | --- | --- | 781 | 1170 | 908 | 262 |
| 612.0406 | PIPE UNDERDRAIN WRAPPED 6-INCH | LF | --- | 115 | --- | --- | 115 | 230 | 201 | 29 |
| 614.0150 | ANCHOR ASSEMBLIES FOR STEEL PLATE BEAM GUARD | EACH | 4 | --- | --- | --- | --- | 4 | 4 | --- |
| 645.0111 | GEOTEXTILE TYPE DF SCHEDULE A | SY | --- | 36 | --- | --- | 36 | 72 | 49 | 23 |
| 645.0120 | GEOTEXTILE TYPE HR | SY | --- | 1480 | --- | --- | 760 | 2240 | 1732 | 508 |
| SPV.0060.03 | CROSSHOLE SONIC LOG (CSL) TESTING, DRILLED SHAFT FOUNDATION 54-INCH | EACH | --- | --- | 3 | 3 | -- | 6 | 6 | -- |
| SPV.0060.04 | THERMAL INTEGRITY PROFILER (TIP) TESTING, DRILLED SHAFT FOUNDATION 54-INCH | EACH | --- | --- | 3 | 3 | -- | 6 | 6 | -- |
| SPV.0090.02 | DRILLED SHAFT FOUNDATION 54-INCH | LF | --- | -- | 165 | 129 | -- | 294 | 177 | 117 |
| SPV.0195.01 | SELECT CRUSHED MATERIAL FOR TRAVEL CORRIDOR | TON | --- | 392 | -- | -- | 196 | 588 | 455 | 133 |
| | | | | | | | | | | |
| | NON-BID ITEMS | | | | | | | | | |
| | FILLER | SIZE | --- | --- | --- | --- | --- | ½" | --- | --- |
| | | | | | | | | | | |

1

Addendum No. 01
ID 7840-03-73
Revised Sheet 78
August 2, 2024

## GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.

BAR STEEL REINFORCEMENT SHALL BE EMBEDDED 2" CLEAR UNLESS OTHERWISE SHOWN OR NOTED OTHERWISE.

THE FIRST OR FIRST TWO DIGITS OF THE BAR MARK SIGNIFIES THE BAR SIZE.

BEVEL EXPOSED EDGES OF CONCRETE ¾" UNLESS OTHERWISE NOTED.

THE UPPER LIMITS OF "EXCAVATION FOR STRUCTURES B-10-0398" SHALL BE THE EXISTING GROUNDLINE.

THE EXISTING STRUCTURE (B-10-0378) IS A STEEL TRUSS BRIDGE, 286.5' LONG X 25' WIDE, TO BE REMOVED.

AT THE BACK FACE OF ABUTMENT ALL VOLUME WHICH CANNOT BE PLACED BEFORE ABUTMENT CONSTRUCTION AND IS NOT OCCUPIED BY THE NEW STRUCTURE SHALL BE BACKFILLED WITH STRUCTURE BACKFILL TYPE A.

EXCAVATION BELOW THE ABUTMENT AND ABUTMENT BEDDING MATERIALS REQUIRES ENGINEER APPROVAL. GEOTEXTILE SHALL BE SET AT THE BOTTOM OF EXCAVATION AND EXTEND 2'-0" ABOVE BOTTOM OF ABUTMENT.

THE QUANTITY FOR BACKFILL STRUCTURE IS CALCULATED BASED ON THE DETAIL SHOWN IN THE PLANS.

ELASTOMERIC BEARING PADS NEED NOT BE INDIVIDUALLY MOLDED PROVIDED THE CUT EDGES ARE SMOOTH AND TRUE.

PROTECTIVE SURFACE TREATMENT TO BE APPLIED TO THE ENTIRE EXPOSED TOP OF DECK, VERTICAL AND HORIZONTAL SURFACES OF THE PAVING NOTCHES AT ABUTMENT DIAPHRAGMS, TOP AND EXTERIOR EXPOSED FACES OF WINGS, AND THE END 1'-0" OF THE FRONT FACE OF THE ABUTMENT.

PIGMENTED SURFACE SEALER TO BE APPLIED TO THE FRONT FACE, BACK FACE AND THE TOP OF THE SINGLE SLOPE PARAPET 42SS MODIFIED.

THE SLOPE OF THE FILL IN FRONT OF THE ABUTMENTS SHALL BE COVERED WITH HEAVY RIPRAP, SELECT CRUSHED MATERIAL FOR TRAVEL CORRIDOR, AND GEOTEXTILE TYPE "HR" TO THE EXTENT SHOWN ON THE GENERAL PLAN SHEET OR AS DIRECTED BY THE ENGINEER.

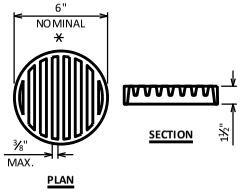
THE HAUNCH CONCRETE QUANTITY IS BASED ON THE AVERAGE HAUNCH SHOWN ON THE "45W" PRESTRESSED GIRDER DETAILS 2" SHEET.

THE EXISTING STREAM BED SHALL BE USED AS THE UPPER LIMITS OF EXCAVATION AT THE PIERS.

ALL REQUIRED REMOVAL OF THE EXISTING SUBSTRUCTURE IS INCLUDED IN THE BID ITEM "REMOVING STRUCTURE OVER WATERWAY REMOVE DEBRIS B-10-0378". BID ITEM ALSO INCLUDES THE REMOVAL OF OLD CULVERT PIPES AND TIMBER PILES UNDER THE EXISTING BRIDGE TO AT LEAST 2 FEET BELOW THE FINISHED GROUND LINE.

EXCAVATION REQUIRED UNDER THE BID ITEM "EXCAVATION FOR STRUCTURES B-10-0398" IS NOT USED TO BALANCE EARTHWORK.

1 BAR STEEL REINFORCEMENT INCLUDED WITHIN THE LIMITS OF "DRILLED SHAFT FOUNDATION 54-INCH" IS PAID FOR UNDER THE "BAR STEEL REINFORCEMENT HS STRUCTURES" BID ITEM. CONCRETE INCLUDED WITHIN THE LIMITS OF "DRILLED SHAFT FOUNDATION 54-INCH" AS SHOWN ON SHEET 18 AND 20 IS PAID FOR UNDER BID ITEM "DRILLED SHAFT FOUNDATION 54-INCH".

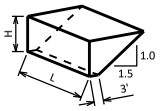



## RODENT SHIELD DETAIL

✳ DIMENSIONS ARE APPROXIMATE. THE GRATE IS SIZED TO FIT INTO A PIPE COUPLING. ORIENT SO SLOTS ARE VERTICAL.

THE RODENT SHIELD, PIPE COUPLING AND SCREWS SHALL BE CONSIDERED INCIDENTAL TO THE BID ITEM "PIPE UNDERDRAIN WRAPPED 6-INCH".

THE RODENT SHIELD SHALL BE A PVC GRATE SIMILAR TO THIS DETAIL. THE GRATE IS COMMERCIALLY AVAILABLE AS A FLOOR STRAINER. A PIPE COUPLING IS REQUIRED FOR THE ATTACHMENT OF THIS SHIELD TO THE EXPOSED END OF THE PIPE UNDERDRAIN. THE SHIELD SHALL BE FASTENED TO THE PIPE COUPLING WITH TWO OR MORE NO. 10 X 1-INCH STAINLESS STEEL SHEET METAL SCREWS.




## ABUTMENT BACKFILL DIAGRAM

L = OUT TO OUT OF ABUTMENT BODY INCLUDING WINGS (FT)
H = AVERAGE ABUTMENT FILL HEIGHT (FT)
EF = EXPANSION FACTOR (1.20 FOR CY BID ITEMS AND 1.00 FOR TON BID ITEMS)
$V_{CF}$ = (L)(3.0')(H) + (L)(0.5)(1.5H)(H)
$V_{CY}$ = $V_{CF}$(EF)/27
$V_{TON}$ = $V_{CY}$(2.0)

SDR
08/01/24


| NO. | DATE | REVISION | BY |
|---|---|---|---|
| 1 | 07/24 | COLUMN & SHAFT DIAMETER | UD |

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

**STRUCTURE B-10-398**

DRAWN BY DCH | PLANS CK'D JRD

**GENERAL NOTES & QUANTITIES**

SHEET 3 OF 33

78

SCALE =

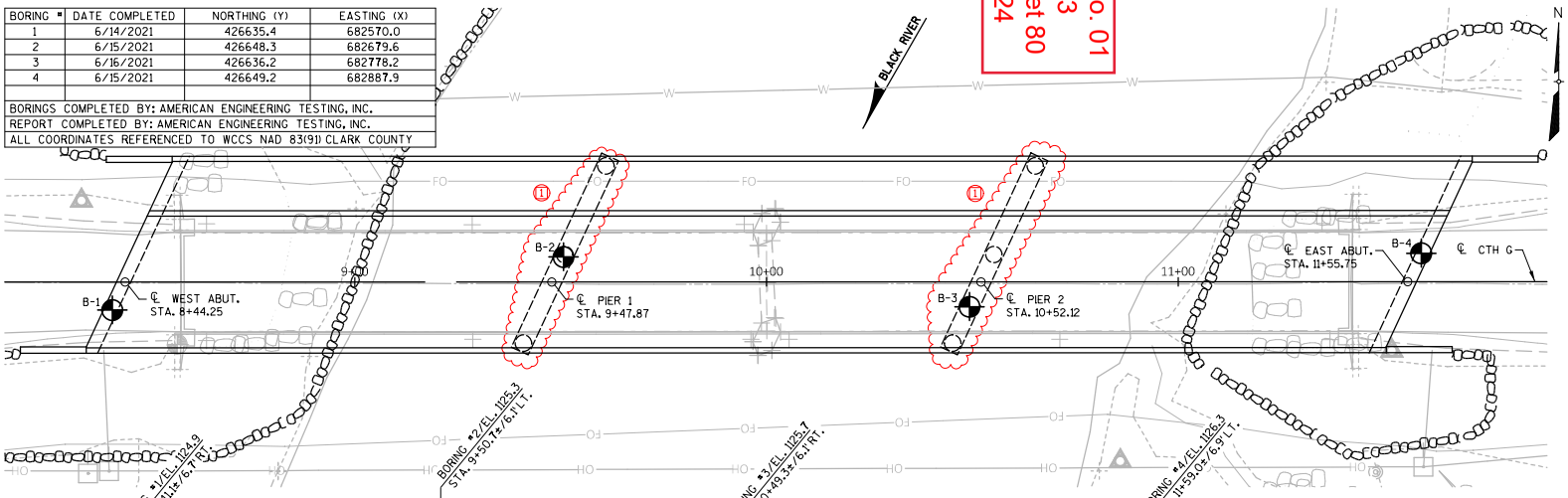
8

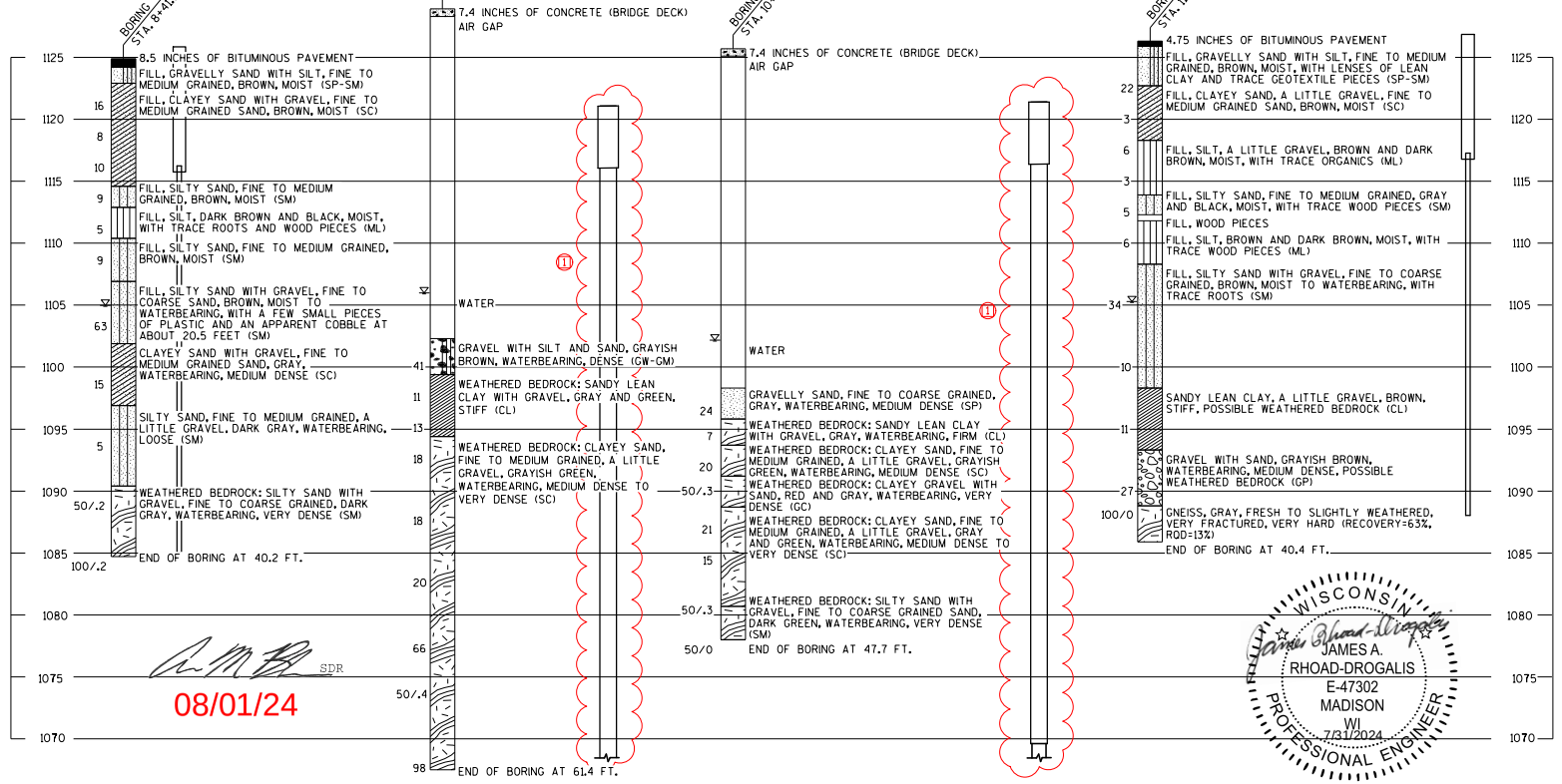
8

Addendum No. 01
ID 7840-03-73
Revised Sheet 80
August 2, 2024

| BORING # | DATE COMPLETED | NORTHING (Y) | EASTING (X) |
|---|---|---|---|
| 1 | 6/14/2021 | 426635.4 | 682570.0 |
| 2 | 6/15/2021 | 426648.3 | 682679.6 |
| 3 | 6/16/2021 | 426636.2 | 682778.2 |
| 4 | 6/15/2021 | 426649.2 | 682887.9 |
| | | | |

BORINGS COMPLETED BY: AMERICAN ENGINEERING TESTING, INC.
REPORT COMPLETED BY: AMERICAN ENGINEERING TESTING, INC.
ALL COORDINATES REFERENCED TO WCCS NAD 83(91) CLARK COUNTY




SDR
08/01/24

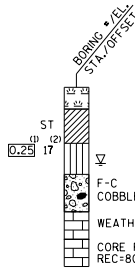
WISCONSIN
James Rhoad-Drogalis
JAMES A. RHOAD-DROGALIS
E-47302
MADISON
WI
7/31/2024
PROFESSIONAL ENGINEER

STATE PROJECT NUMBER
7840-03-73

MATERIAL SYMBOLS

| | | |
|---|---|---|
| ASPHALT | TOPSOIL | PEAT |
| CONCRETE | FILL | GRAVEL |
| SAND | CLAY | SILT |
| BOULDERS OR COBBLES | LIMESTONE | BEDROCK (UNKNOWN) |
| SHALE | SANDSTONE | IGNEOUS/ META |

LEGEND OF BORING




(1) UNCONFINED STRENGTH, AS DETERMINED BY A POCKET PENETROMETER (TSF)

(2) UNLESS OTHERWISE, SPECIFIED THE SPT 'N' VALUE IS BASED ON AASHTO T-206, STANDARD PENETRATION TEST. THE SPT 'N' VALUE PRESENTED HAS NOT BEEN CORRECTED FOR OVERBURDEN PRESSURE OR HAMMER EFFICIENCY.

GROUND WATER ELEVATION
- AT TIME OF DRILLING
- END OF DRILLING
- AFTER DRILLING

ABBREVIATIONS
F-FINE M-MEDIUM C-COARSE ST-SHELBY TUBE

SUBSURFACE EXPLORATION FOR FOUNDATION DESIGN AND BIDDERS INFORMATION

BORINGS WERE COMPLETED AT POINTS APPROXIMATELY AS INDICATED ON THIS DRAWING TO OBTAIN INFORMATION CONCERNING THE CHARACTER OF SUBSURFACE MATERIALS FOUND AT THE SITE. BECAUSE THE INVESTIGATED DEPTHS ARE LIMITED AND THE AREA OF THE BORINGS IS VERY SMALL IN RELATION TO THE ENTIRE SITE, THE WISCONSIN DEPARTMENT OF TRANSPORTATION DOES NOT WARRANT SIMILAR SUBSURFACE CONDITIONS BELOW, BETWEEN, OR BEYOND THESE BORINGS. VARIATIONS IN SOIL CONDITIONS SHOULD BE EXPECTED AND FLUCTUATIONS IN GROUNDWATER LEVELS MAY OCCUR.

| NO. | DATE | REVISION | BY |
|---|---|---|---|
| 1 | 07/24 | COLUMN & SHAFT DIAMETER | UD |

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

STRUCTURE B-10-398

DRAWN BY: MES | PLANS CK'D.: JRD

SUBSURFACE EXPLORATION

SHEET 5 OF 33

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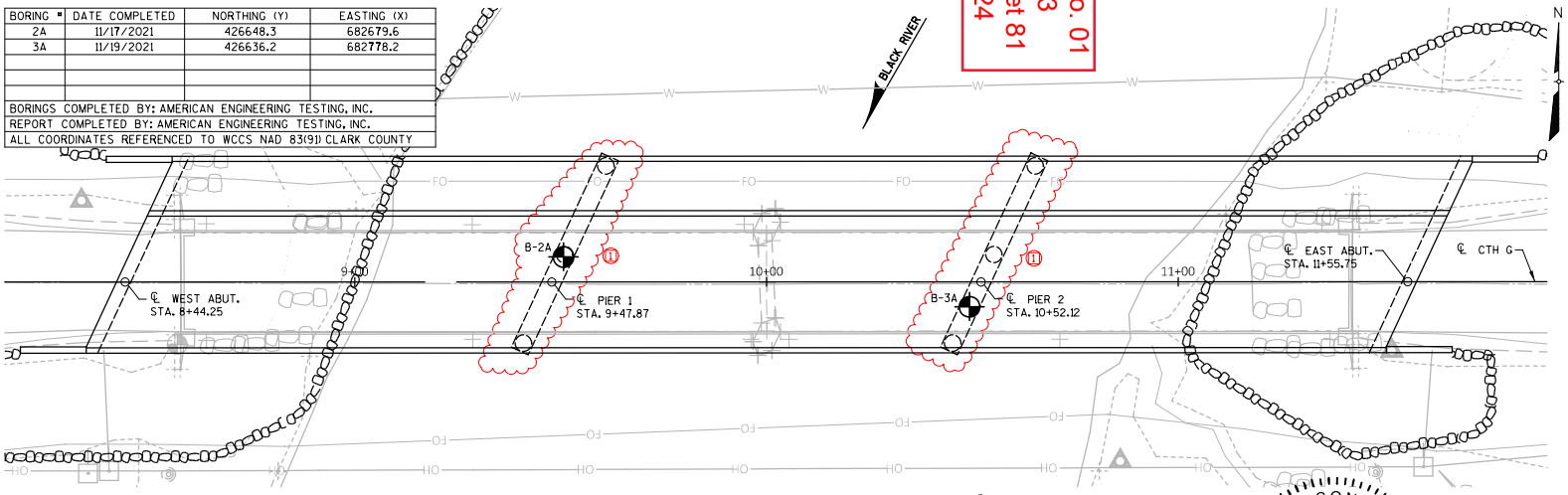
SCALE =

Addendum No. 01
ID 7840-03-73
Revised Sheet 81
August 2, 2024

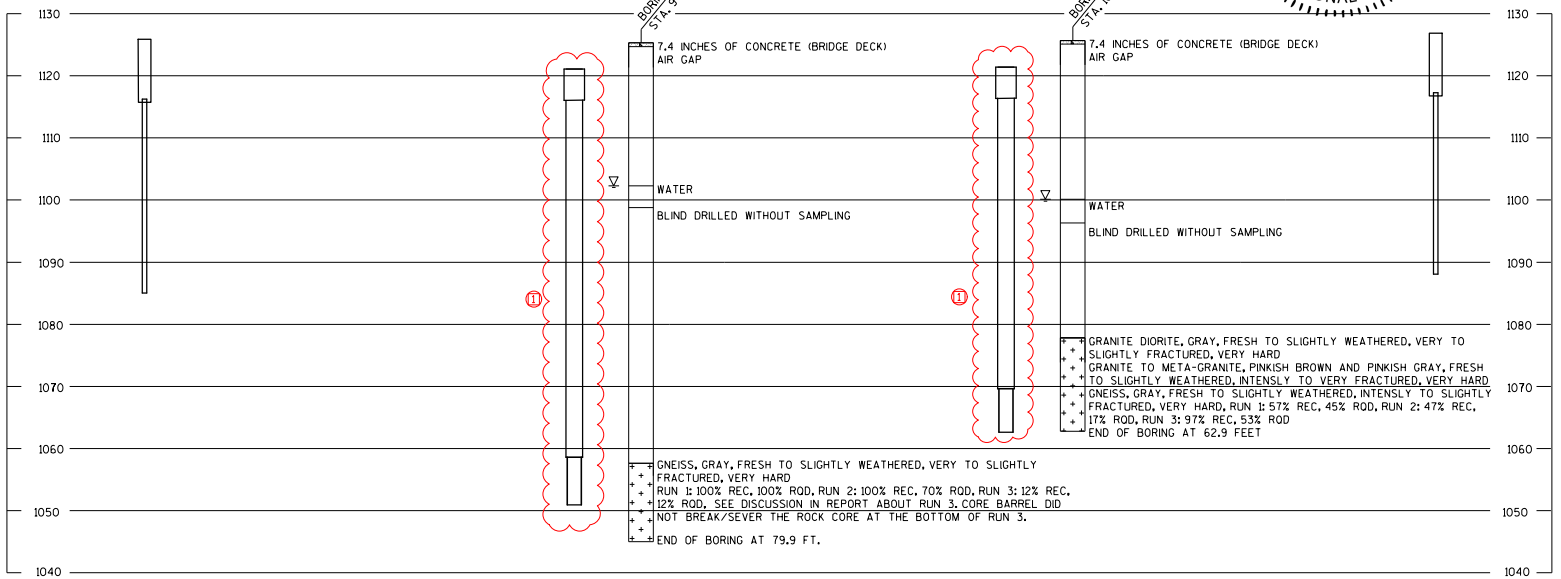
| BORING # | DATE COMPLETED | NORTHING (Y) | EASTING (X) |
|---|---|---|---|
| 2A | 11/17/2021 | 426648.3 | 682679.6 |
| 3A | 11/19/2021 | 426636.2 | 682778.2 |
| | | | |
| | | | |
| | | | |

BORINGS COMPLETED BY: AMERICAN ENGINEERING TESTING, INC.
REPORT COMPLETED BY: AMERICAN ENGINEERING TESTING, INC.
ALL COORDINATES REFERENCED TO WCCS NAD 83(91) CLARK COUNTY




SDR
08/01/24

WISCONSIN
JAMES A. RHOAD-DROGALIS
E-47302
MADISON
WI
7/30/2024
PROFESSIONAL ENGINEER

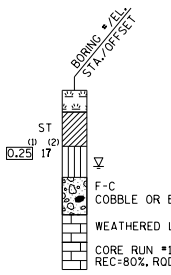



STATE PROJECT NUMBER
7840-03-73

MATERIAL SYMBOLS

| | | |
|---|---|---|
| ASPHALT | TOPSOIL | PEAT |
| CONCRETE | FILL | GRAVEL |
| SAND | CLAY | SILT |
| BOULDERS OR COBBLES | LIMESTONE | BEDROCK (UNKNOWN) |
| SHALE | SANDSTONE | IGNEOUS/ META |

LEGEND OF BORING




(1) UNCONFINED STRENGTH, AS DETERMINED BY A POCKET PENETROMETER (TSF)

(2) UNLESS OTHERWISE, SPECIFIED THE SPT 'N' VALUE IS BASED ON AASHTO T-206, STANDARD PENETRATION TEST. THE SPT 'N' VALUE PRESENTED HAS NOT BEEN CORRECTED FOR OVERBURDEN PRESSURE OR HAMMER EFFICIENCY.

GROUND WATER ELEVATION
- AT TIME OF DRILLING
- END OF DRILLING
- AFTER DRILLING

ABBREVIATIONS
F-FINE M-MEDIUM C-COARSE ST-SHELBY TUBE

SUBSURFACE EXPLORATION FOR FOUNDATION DESIGN AND BIDDERS INFORMATION

BORINGS WERE COMPLETED AT POINTS APPROXIMATELY AS INDICATED ON THIS DRAWING TO OBTAIN INFORMATION CONCERNING THE CHARACTER OF SUBSURFACE MATERIALS FOUND AT THE SITE. BECAUSE THE INVESTIGATED DEPTHS ARE LIMITED AND THE AREA OF THE BORINGS IS VERY SMALL IN RELATION TO THE ENTIRE SITE, THE WISCONSIN DEPARTMENT OF TRANSPORTATION DOES NOT WARRANT SIMILAR SUBSURFACE CONDITIONS BELOW, BETWEEN, OR BEYOND THESE BORINGS. VARIATIONS IN SOIL CONDITIONS SHOULD BE EXPECTED AND FLUCTUATIONS IN GROUNDWATER LEVELS MAY OCCUR.

| NO. | DATE | REVISION | BY |
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STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

STRUCTURE B-10-398

DRAWN BY MES | PLANS CK'D. JRD

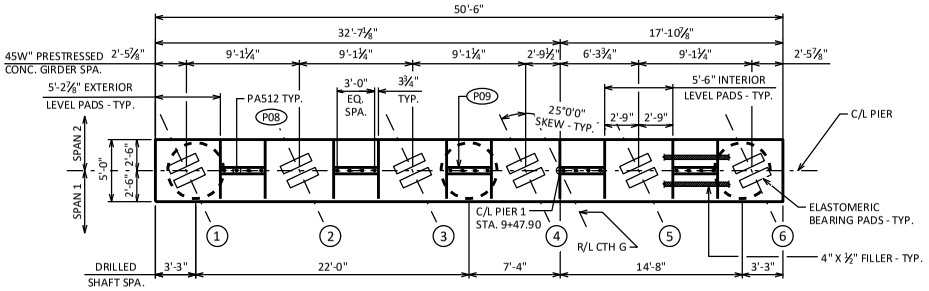
SUBSURFACE EXPLORATION

SHEET 6 OF 33
81

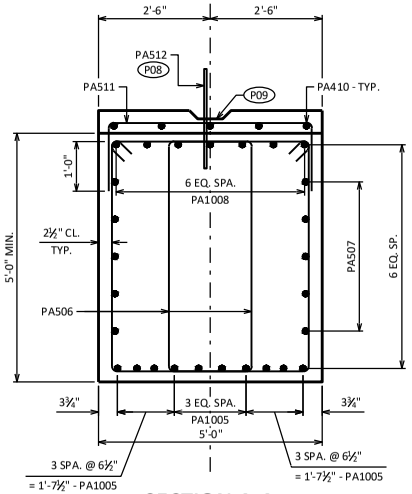
SCALE =

STATE PROJECT NUMBER

**7840-03-73**



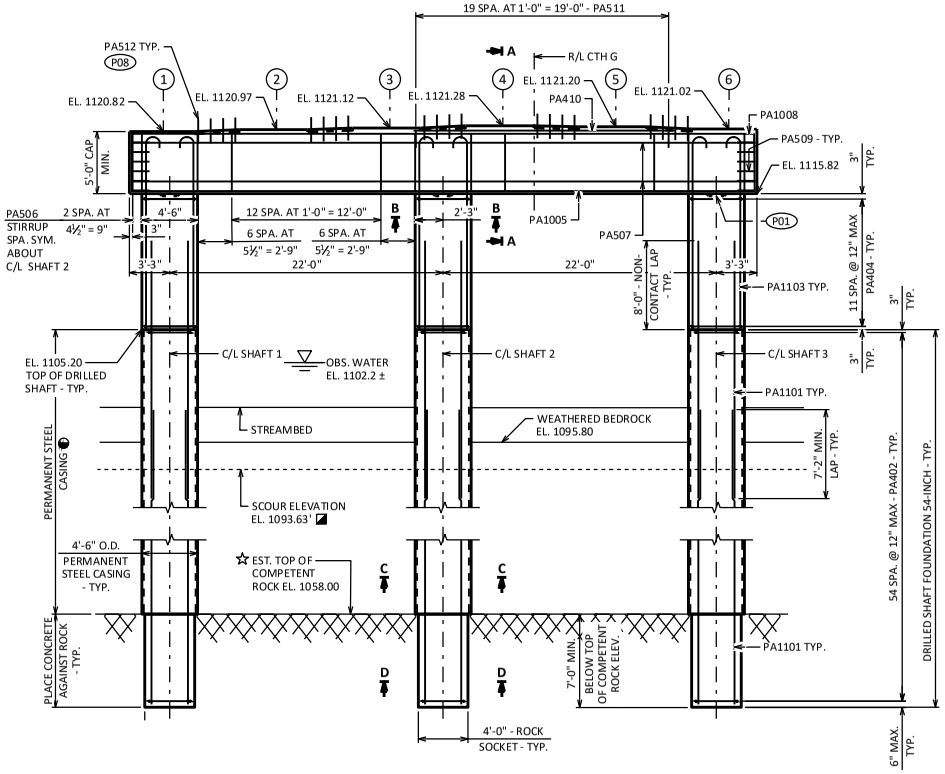

## PLAN




## SECTION A-A

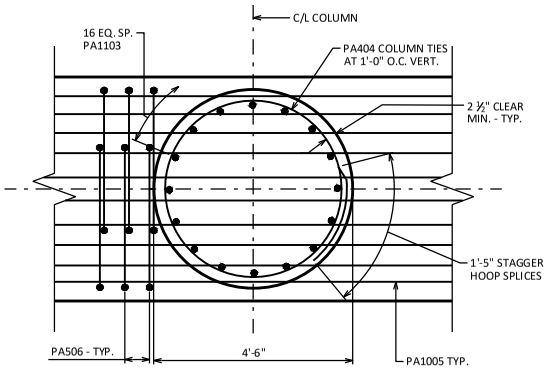
SECTION THROUGH PIER CAP.

- ◪ SCOUR ELEVATION IS BASED ON HYDRAULIC ANALYSIS.
- ☆ COMPETENT ROCK ELEVATIONS ARE BASED ON SUBSURFACE EXPLORATION DATA. GEOTECHNICAL ENGINEER TO VERIFY COMPETENT ROCK ELEVATION.
- ◐ ESTIMATED PERMANENT STEEL CASING LENGTH
  - SHAFT 1 47'-0" ±
  - SHAFT 2 47'-0" ±
  - SHAFT 3 47'-0" ±
- (P01) 1'-3" X 1'-3" X 2" DEEP CONSTRUCTION JOINT FORMED BY BEVELED KEYWAY AT EACH SHAFT.
- (P08) PA512 BARS AT 1'-0" CTRS. BETWEEN BEAM SEATS. MAY BE PLACED AFTER CONCRETE IS POURED BUT BEFORE INITIAL SET HAS TAKEN PLACE. (EMBED 1'-0" INTO CONC.)
- (P09) KEYED CONSTRUCTION JOINT - FORMED BY BEVELED 2" X 6" BETWEEN BEAM SEATS.




## ELEVATION

(LOOKING EAST)




## SECTION B-B

SECTION THROUGH COLUMN

Addendum No. 01
ID 7840-03-73
Revised Sheet 93
August 2, 2024

SDR

08/01/24

WISCONSIN
JAMES A. RHOAD-DROGALIS
E-47302
MADISON
WI
7/29/2024
PROFESSIONAL ENGINEER

| NO. | DATE | REVISION | BY |
|---|---|---|---|
| 1 | 07/24 | COLUMN & SHAFT DIAMETER | UD |

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

**STRUCTURE B-10-398**

DRAWN BY JAC | PLANS CK'D JRD

**PIER 1**

SHEET 18 OF 33

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1

| STATE PROJECT NUMBER |
|---|
| 7840-03-73 |

Addendum No. 01
ID 7840-03-73
Revised Sheet 94
August 2, 2024

## BILL OF BARS

NOTE: THE FIRST OR FIRST TWO DIGITS OF THE BAR MARK SIGNIFIES THE BAR SIZE

| BAR MARK | COAT | NO. REQ'D. | LENGTH | BENT | BAR SERIES | LOCATION | ORIEN. |
|---|---|---|---|---|---|---|---|
| NON-COATED BARS | | | | | | TOTAL WEIGHT = 30,260 | |
| PA1101 | | 96 | 34-7 | | | SHAFT | VERT. |
| PA402 | | 165 | 12-2 | X | | SHAFT | HORIZ. |
| PA1103 | | 48 | 16-9 | X | | COLUMN | VERT. |
| PA404 | | 36 | 14-3 | X | | COLUMN | HORIZ. |
| PA1005 | | 10 | 50-1 | | | PIER CAP - BOT. LONG. BARS | HORIZ. |
| PA506 | | 112 | 16-0 | X | | PIER CAP - STIRRUP BARS | VERT. |
| PA507 | | 10 | 50-1 | | | PIER CAP - LONGITUDINAL BARS | HORIZ. |
| PA1008 | | 7 | 58-8 | X | | PIER CAP - TOP LONG. BARS | HORIZ. |
| PA509 | | 12 | 7-1 | X | | PIER CAP - END BARS | HORIZ. |
| PA410 | | 5 | 19-0 | | | PIER CAP - ADDITIONAL TOP LONG. BARS | HORIZ. |
| PA511 | | 20 | 7-3 | X | | PIER CAP - ADDITIONAL TOP U-BARS | VERT. |
| PA512 | | 20 | 2-0 | | | PIER CAP - DOWEL BARS | VERT. |
| | | | | | | | |

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08/01/24

WISCONSIN
JAMES A. RHOAD-DROGALIS
E-47302
MADISON
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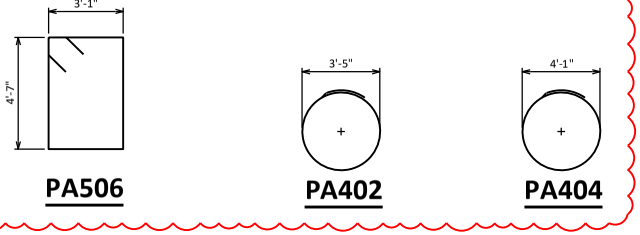
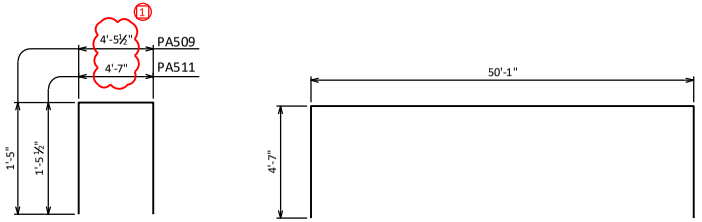
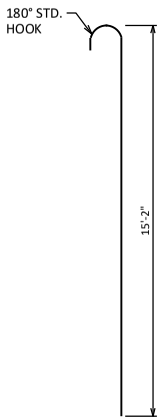


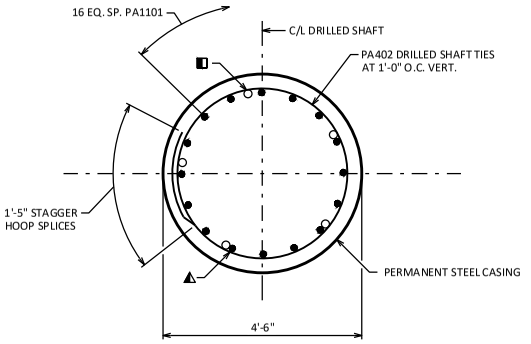

**PA506** **PA402** **PA404**



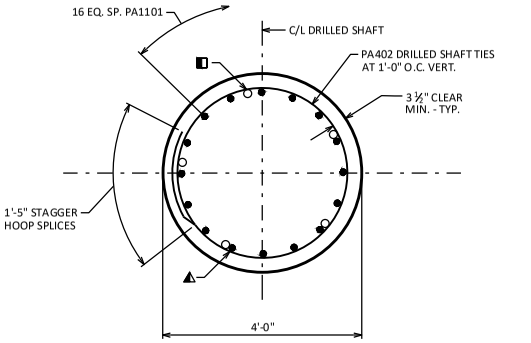

**PA509, PA511** **PA1008**




**PA1103**




**SECTION C-C**
SECTION THROUGH DRILLED SHAFT




**SECTION D-D**
SECTION THROUGH ROCK SOCKET

◧ (5)-2" DIA. CSL TUBES FULL LENGTH OF SHAFT TIED INSIDE AND EVENLY SPACED AROUND THE PERIMETER OF REINFORCEMENT. EXTEND CSL TUBES 3'-0" ABOVE TOP OF SHAFT. REMOVE CSL TUBES DOWN TO TOP OF SHAFT AFTER TESTING IS COMPLETE.

⚠ 5-THERMAL WIRES FOR TIP TESTING. DISTRIBUTE WIRES EVENLY AROUND THE PERIMETER OF THE REINFORCEMENT TIED TO VERTICAL BARS.

| NO. | DATE | REVISION | BY |
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STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

**STRUCTURE B-10-398**

DRAWN BY JAC | PLANS CK'D JRD

**PIER 1 DETAILS**

SHEET 19 OF 33

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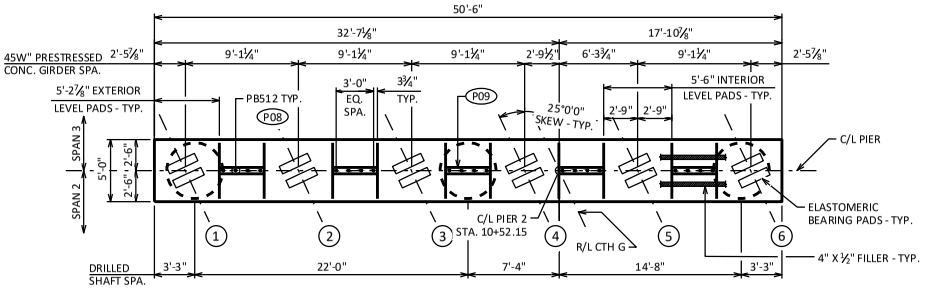
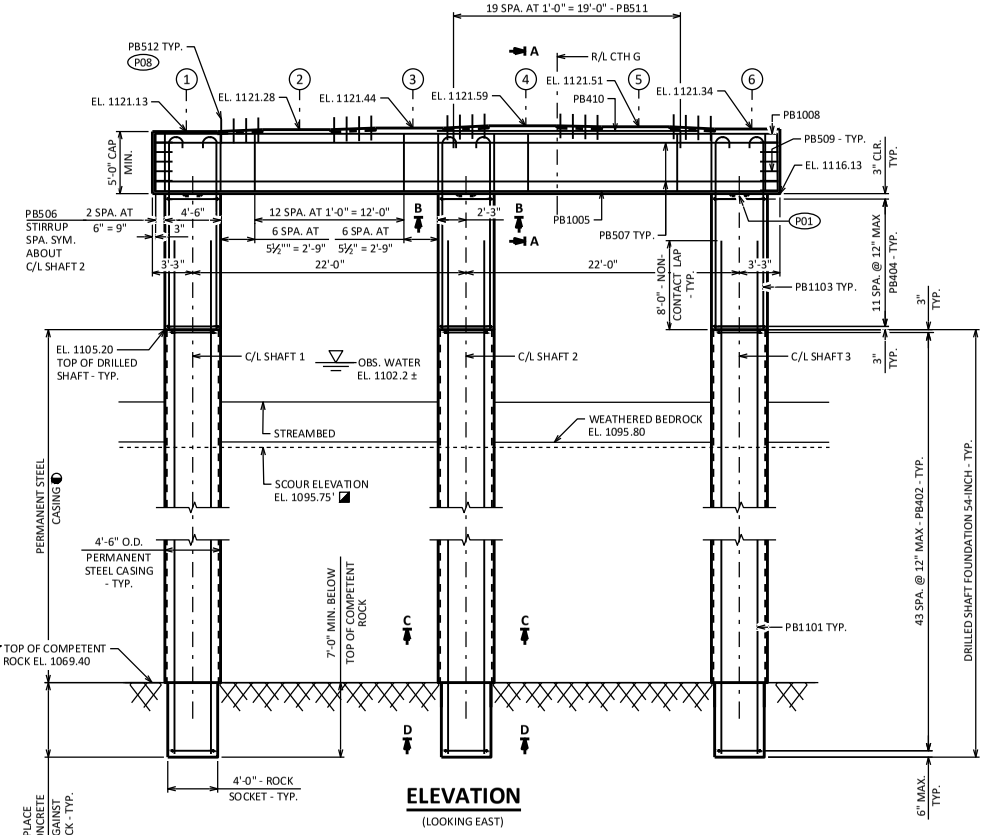
STATE PROJECT NUMBER

**7840-03-73**

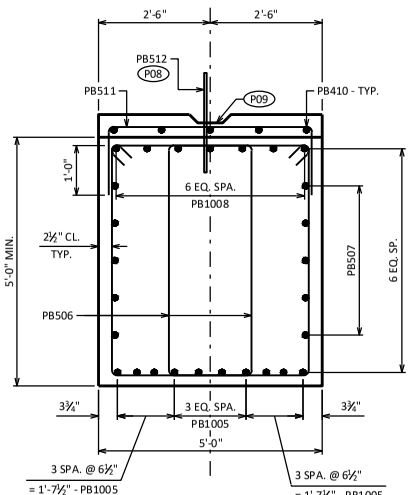



## PLAN




## ELEVATION

(LOOKING EAST)




## SECTION A-A

SECTION THROUGH PIER CAP.

SCOUR ELEVATION IS BASED ON HYDRAULIC ANALYSIS.

☆ COMPETENT ROCK ELEVATIONS ARE BASED ON SUBSURFACE EXPLORATION DATA. GEOTECHNICAL ENGINEER TO VERIFY COMPETENT ROCK ELEVATION.

◐ ESTIMATED PERMANENT STEEL CASING LENGTH
SHAFT 1 35'-9" ±
SHAFT 2 35'-9" ±
SHAFT 3 35'-9" ±

(P01) 1'-3" X 1'-3" X 2" DEEP CONSTRUCTION JOINT FORMED BY BEVELED KEYWAY AT EACH SHAFT.

(P08) PB512 BARS AT 1'-0" CTRS. BETWEEN BEAM SEATS. MAY BE PLACED AFTER CONCRETE IS POURED BUT BEFORE INITIAL SET HAS TAKEN PLACE. (EMBED 1'-0" INTO CONC.)

(P09) KEYED CONSTRUCTION JOINT - FORMED BY BEVELED 2" X 6" BETWEEN BEAM SEATS.

Addendum No. 01
ID 7840-03-73
Revised Sheet 95
August 2, 2024

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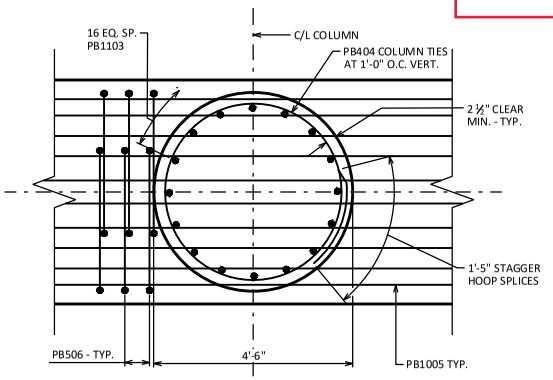
08/01/24




## SECTION B-B

SECTION THROUGH COLUMN

WISCONSIN
JAMES A. RHOAD-DROGALIS
E-47302
MADISON
WI
7/29/2024
PROFESSIONAL ENGINEER

| NO. | DATE | REVISION | BY |
|---|---|---|---|
| 1 | 07/24 | COLUMN & SHAFT DIAMETER | UD |

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

**STRUCTURE B-10-398**

DRAWN BY JAC | PLANS CK'D JRD

**PIER 2**

SHEET 20 OF 33

95

| STATE PROJECT NUMBER |
|---|
| 7840-03-73 |

## BILL OF BARS

NOTE: THE FIRST OR FIRST TWO DIGITS OF THE BAR MARK SIGNIFIES THE BAR SIZE

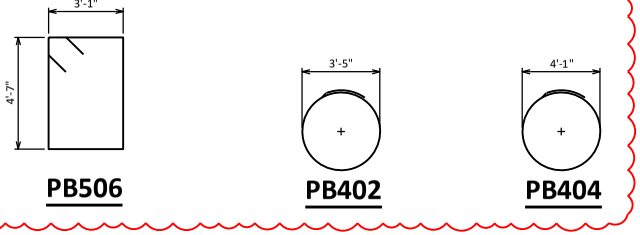
| BAR MARK | COAT | NO. REQ'D. | LENGTH | BENT | BAR SERIES | LOCATION | ORIEN. |
|---|---|---|---|---|---|---|---|
| NON-COATED BARS | | | | | | TOTAL WEIGHT = 25,360 | |
| PB1101 | | 48 | 50-8 | | | SHAFT | VERT. |
| PB402 | | 132 | 12-2 | X | | SHAFT | HORIZ. |
| PB1103 | | 48 | 17-1 | X | | COLUMN | VERT. |
| PB404 | | 36 | 14-3 | X | | COLUMN | HORIZ. |
| PB1005 | | 10 | 50-1 | | | PIER CAP - BOT. LONG. BARS | HORIZ. |
| PB506 | | 112 | 16-0 | X | | PIER CAP - STIRRUP BARS | VERT. |
| PB507 | | 10 | 50-1 | | | PIER CAP - LONGITUDINAL BARS | HORIZ. |
| PB1008 | | 7 | 58-8 | X | | PIER CAP - TOP LONG. BARS | HORIZ. |
| PB509 | | 12 | 7-1 | X | | PIER CAP - END BARS | HORIZ. |
| PB410 | | 5 | 19-0 | | | PIER CAP - ADDITIONAL TOP LONG. BARS | HORIZ. |
| PB511 | | 20 | 7-3 | X | | PIER CAP - ADDITIONAL TOP U-BARS | VERT. |
| PB512 | | 20 | 2-0 | | | PIER CAP - DOWEL BARS | VERT. |
| | | | | | | | |

1

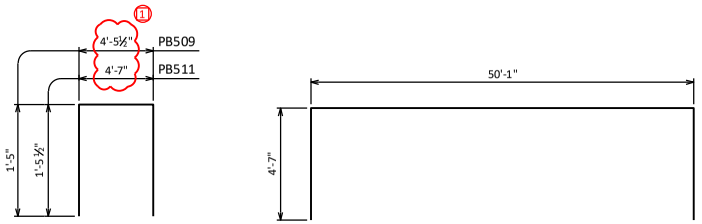
Addendum No. 01
ID 7840-03-73
Revised Sheet 96
August 2, 2024

SDR
08/01/24

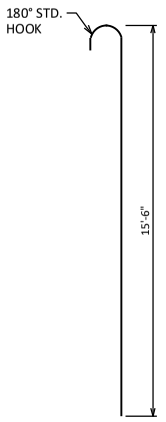
WISCONSIN
JAMES A.
RHOAD-DROGALIS
E-47302
MADISON
WI
7/29/2024
PROFESSIONAL ENGINEER



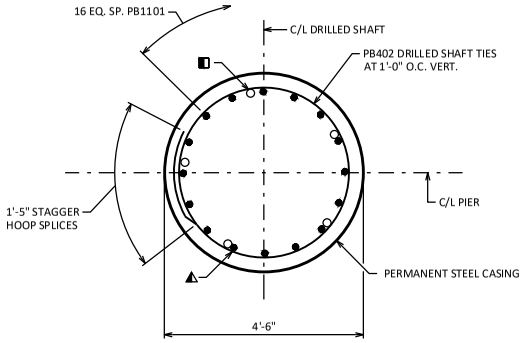

PB506 PB402 PB404



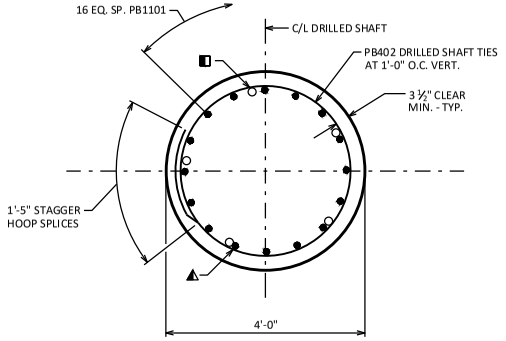

PB509, PB511 PB1008




PB1103




### SECTION C-C
SECTION THROUGH DRILLED SHAFT




### SECTION D-D
SECTION THROUGH ROCK SOCKET

◧ (5)-2" DIA. CSL TUBES FULL LENGTH OF SHAFT TIED INSIDE AND EVENLY SPACED AROUND THE PERIMETER OF REINFORCEMENT. EXTEND CSL TUBES 3'-0" ABOVE TOP OF SHAFT. REMOVE CSL TUBES DOWN TO TOP OF SHAFT AFTER TESTING IS COMPLETE.

◭ 5-THERMAL WIRES FOR TIP TESTING. DISTRIBUTE WIRES EVENLY AROUND THE PERIMETER OF THE REINFORCEMENT TIED TO VERTICAL BARS.

| NO. | DATE | REVISION | BY |
|---|---|---|---|
| 1 | 07/24 | COLUMN & SHAFT DIAMETER | UD |

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

**STRUCTURE B-10-398**

DRAWN BY JAC | PLANS CK'D JRD

**PIER 2 DETAILS**

SHEET 21 OF 33

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**Proposal ID:** 20240813016 **Project(s):** 7840-03-73

**Federal ID(s):** WISC 2024421

**SECTION:** 0001 Contract Items

**Alt Set ID:** **Alt Mbr ID:**

| Proposal Line Number | Item ID<br>Description | Approximate Quantity and Units | Unit Price | Bid Amount |
|---|---|---|---|---|
| 0002 | 201.0105<br>Clearing | 10.000<br>STA | _____.____ | _____.____ |
| 0004 | 201.0205<br>Grubbing | 6.000<br>STA | _____.____ | _____.____ |
| 0006 | 203.0250<br>Removing Structure Over Waterway Remove Debris (structure) 01. B-10-0378 | 1.000<br>EACH | _____.____ | _____.____ |
| 0008 | 204.0165<br>Removing Guardrail | 311.000<br>LF | _____.____ | _____.____ |
| 0010 | 205.0100<br>Excavation Common | 432.000<br>CY | _____.____ | _____.____ |
| 0012 | 206.1001<br>Excavation for Structures Bridges (structure) 01. B-10-0398 | 1.000<br>EACH | _____.____ | _____.____ |
| 0014 | 208.0100<br>Borrow | 3,970.000<br>CY | _____.____ | _____.____ |
| 0016 | 210.1500<br>Backfill Structure Type A | 640.000<br>TON | _____.____ | _____.____ |
| 0018 | 213.0100<br>Finishing Roadway (project) 01. 7840-03-73 | 1.000<br>EACH | _____.____ | _____.____ |
| 0020 | 305.0110<br>Base Aggregate Dense 3/4-Inch | 231.000<br>TON | _____.____ | _____.____ |
| 0022 | 305.0120<br>Base Aggregate Dense 1 1/4-Inch | 1,638.000<br>TON | _____.____ | _____.____ |
| 0024 | 415.0060<br>Concrete Pavement 6-Inch | 32.000<br>SY | _____.____ | _____.____ |
| 0026 | 415.0410<br>Concrete Pavement Approach Slab | 110.000<br>SY | _____.____ | _____.____ |
| 0028 | 450.4000<br>HMA Cold Weather Paving | 271.000<br>TON | _____.____ | _____.____ |
| 0030 | 455.0605<br>Tack Coat | 77.000<br>GAL | _____.____ | _____.____ |

**Proposal ID:** 20240813016 **Project(s):** 7840-03-73

**Federal ID(s):** WISC 2024421

**SECTION:** 0001 Contract Items

**Alt Set ID:** **Alt Mbr ID:**

| Proposal Line Number | Item ID<br>Description | Approximate Quantity and Units | Unit Price | Bid Amount |
|---|---|---|---|---|
| 0032 | 465.0105<br>Asphaltic Surface | 271.000<br>TON | _____.____ | _____.____ |
| 0034 | 502.0100<br>Concrete Masonry Bridges | 818.000<br>CY | _____.____ | _____.____ |
| 0036 | 502.3200<br>Protective Surface Treatment | 1,825.000<br>SY | _____.____ | _____.____ |
| 0038 | 502.3210<br>Pigmented Surface Sealer | 274.000<br>SY | _____.____ | _____.____ |
| 0040 | 503.0146<br>Prestressed Girder Type I 45W-Inch | 1,872.000<br>LF | _____.____ | _____.____ |
| 0042 | 505.0400<br>Bar Steel Reinforcement HS Structures | 61,920.000<br>LB | _____.____ | _____.____ |
| 0044 | 505.0600<br>Bar Steel Reinforcement HS Coated Structures | 153,580.000<br>LB | _____.____ | _____.____ |
| 0046 | 506.2605<br>Bearing Pads Elastomeric Non-Laminated | 36.000<br>EACH | _____.____ | _____.____ |
| 0048 | 506.4000<br>Steel Diaphragms (structure) 01. B-10-0398 | 30.000<br>EACH | _____.____ | _____.____ |
| 0050 | 509.5100.S<br>Polymer Overlay | 421.000<br>SY | _____.____ | _____.____ |
| 0052 | 513.4061<br>Railing Tubular Type M | 700.000<br>LF | _____.____ | _____.____ |
| 0054 | 514.0445<br>Floor Drains Type GC | 1.000<br>EACH | _____.____ | _____.____ |
| 0056 | 514.2625<br>Downspout 6-Inch | 4.000<br>LF | _____.____ | _____.____ |
| 0058 | 516.0500<br>Rubberized Membrane Waterproofing | 24.000<br>SY | _____.____ | _____.____ |
| 0060 | 550.0500<br>Pile Points | 20.000<br>EACH | _____.____ | _____.____ |

**Proposal ID:** 20240813016 **Project(s):** 7840-03-73

**Federal ID(s):** WISC 2024421

**SECTION:** 0001 Contract Items

**Alt Set ID:** **Alt Mbr ID:**

| Proposal Line Number | Item ID<br>Description | Approximate Quantity and Units | Unit Price | Bid Amount |
|---|---|---|---|---|
| 0062 | 550.1120<br>Piling Steel HP 12-Inch X 53 Lb | 700.000<br>LF | _____.____ | _____.____ |
| 0064 | 606.0300<br>Riprap Heavy | 1,170.000<br>CY | _____.____ | _____.____ |
| 0066 | 612.0406<br>Pipe Underdrain Wrapped 6-Inch | 230.000<br>LF | _____.____ | _____.____ |
| 0068 | 614.0150<br>Anchor Assemblies for Steel Plate Beam Guard | 4.000<br>EACH | _____.____ | _____.____ |
| 0070 | 614.2500<br>MGS Thrie Beam Transition | 157.600<br>LF | _____.____ | _____.____ |
| 0072 | 614.2610<br>MGS Guardrail Terminal EAT | 4.000<br>EACH | _____.____ | _____.____ |
| 0074 | 615.0100<br>Guard Fence Timber Rail | 148.000<br>LF | _____.____ | _____.____ |
| 0076 | 618.0100<br>Maintenance and Repair of Haul Roads (project) 01. 7840-03-73 | 1.000<br>EACH | _____.____ | _____.____ |
| 0078 | 619.1000<br>Mobilization | 1.000<br>EACH | _____.____ | _____.____ |
| 0080 | 624.0100<br>Water | 19.000<br>MGAL | _____.____ | _____.____ |
| 0082 | 625.0100<br>Topsoil | 2,740.000<br>SY | _____.____ | _____.____ |
| 0084 | 628.1504<br>Silt Fence | 1,950.000<br>LF | _____.____ | _____.____ |
| 0086 | 628.1520<br>Silt Fence Maintenance | 1,950.000<br>LF | _____.____ | _____.____ |
| 0088 | 628.1905<br>Mobilizations Erosion Control | 3.000<br>EACH | _____.____ | _____.____ |
| 0090 | 628.1910<br>Mobilizations Emergency Erosion Control | 2.000<br>EACH | _____.____ | _____.____ |

**Proposal ID:** 20240813016 **Project(s):** 7840-03-73

**Federal ID(s):** WISC 2024421

**SECTION:** 0001 Contract Items

**Alt Set ID:** **Alt Mbr ID:**

| Proposal Line Number | Item ID<br>Description | Approximate Quantity and Units | Unit Price | Bid Amount |
|---|---|---|---|---|
| 0092 | 628.2008<br>Erosion Mat Urban Class I Type B | 2,740.000<br>SY | _____.____ | _____.____ |
| 0094 | 628.6005<br>Turbidity Barriers | 790.000<br>SY | _____.____ | _____.____ |
| 0096 | 628.7570<br>Rock Bags | 30.000<br>EACH | _____.____ | _____.____ |
| 0098 | 629.0210<br>Fertilizer Type B | 2.200<br>CWT | _____.____ | _____.____ |
| 0100 | 630.0120<br>Seeding Mixture No. 20 | 40.000<br>LB | _____.____ | _____.____ |
| 0102 | 630.0160<br>Seeding Mixture No. 60 | 11.000<br>LB | _____.____ | _____.____ |
| 0104 | 630.0200<br>Seeding Temporary | 10.000<br>LB | _____.____ | _____.____ |
| 0106 | 630.0500<br>Seed Water | 65.000<br>MGAL | _____.____ | _____.____ |
| 0108 | 634.0814<br>Posts Tubular Steel 2x2-Inch X 14-FT | 1.000<br>EACH | _____.____ | _____.____ |
| 0110 | 637.2210<br>Signs Type II Reflective H | 5.000<br>SF | _____.____ | _____.____ |
| 0112 | 638.2102<br>Moving Signs Type II | 10.000<br>EACH | _____.____ | _____.____ |
| 0114 | 638.2602<br>Removing Signs Type II | 4.000<br>EACH | _____.____ | _____.____ |
| 0116 | 642.5001<br>Field Office Type B | 1.000<br>EACH | _____.____ | _____.____ |
| 0118 | 643.0300<br>Traffic Control Drums | 500.000<br>DAY | _____.____ | _____.____ |
| 0120 | 643.0420<br>Traffic Control Barricades Type III | 2,882.000<br>DAY | _____.____ | _____.____ |
| 0122 | 643.0705<br>Traffic Control Warning Lights Type A | 3,200.000<br>DAY | _____.____ | _____.____ |

**Proposal ID:** 20240813016 **Project(s):** 7840-03-73

**Federal ID(s):** WISC 2024421

**SECTION:** 0001 Contract Items

**Alt Set ID:** **Alt Mbr ID:**

| Proposal Line Number | Item ID<br>Description | Approximate Quantity and Units | Unit Price | Bid Amount |
|---|---|---|---|---|
| 0124 | 643.0900<br>Traffic Control Signs | 19,842.000<br>DAY | _____.____ | _____.____ |
| 0126 | 643.0920<br>Traffic Control Covering Signs Type II | 6.000<br>EACH | _____.____ | _____.____ |
| 0128 | 643.1000<br>Traffic Control Signs Fixed Message | 36.000<br>SF | _____.____ | _____.____ |
| 0130 | 643.5000<br>Traffic Control | 1.000<br>EACH | _____.____ | _____.____ |
| 0132 | 645.0111<br>Geotextile Type DF Schedule A | 72.000<br>SY | _____.____ | _____.____ |
| 0134 | 645.0120<br>Geotextile Type HR | 2,240.000<br>SY | _____.____ | _____.____ |
| 0136 | 646.1005<br>Marking Line Paint 4-Inch | 2,560.000<br>LF | _____.____ | _____.____ |
| 0138 | 650.4500<br>Construction Staking Subgrade | 427.000<br>LF | _____.____ | _____.____ |
| 0140 | 650.5000<br>Construction Staking Base | 371.000<br>LF | _____.____ | _____.____ |
| 0142 | 650.6501<br>Construction Staking Structure Layout (structure) 01. B-10-0398 | 1.000<br>EACH | _____.____ | _____.____ |
| 0144 | 650.7000<br>Construction Staking Concrete Pavement | 56.000<br>LF | _____.____ | _____.____ |
| 0146 | 650.9911<br>Construction Staking Supplemental Control (project) 01. 7840-03-73 | 1.000<br>EACH | _____.____ | _____.____ |
| 0148 | 650.9920<br>Construction Staking Slope Stakes | 427.000<br>LF | _____.____ | _____.____ |
| 0150 | 690.0150<br>Sawing Asphalt | 186.000<br>LF | _____.____ | _____.____ |
| 0152 | 715.0502<br>Incentive Strength Concrete Structures | 4,806.000<br>DOL | 1.00000 | 4,806.00 |

**Proposal ID:** 20240813016 **Project(s):** 7840-03-73

**Federal ID(s):** WISC 2024421

**SECTION:** 0001 Contract Items

**Alt Set ID:** **Alt Mbr ID:**

| Proposal Line Number | Item ID<br>Description | Approximate Quantity and Units | Unit Price | Bid Amount |
|---|---|---|---|---|
| 0154 | 715.0720<br>Incentive Compressive Strength Concrete Pavement | 500.000<br>DOL | 1.00000 | 500.00 |
| 0156 | ASP.1T0A<br>On-the-Job Training Apprentice at $5.00/HR | 1,500.000<br>HRS | 5.00000 | 7,500.00 |
| 0158 | ASP.1T0G<br>On-the-Job Training Graduate at $5.00/HR | 990.000<br>HRS | 5.00000 | 4,950.00 |
| 0160 | SPV.0035<br>Special 01. Excavation, Hauling, and Disposal of Dredged Soil | 350.000<br>CY | _____.____ | _____.____ |
| 0162 | SPV.0060<br>Special 01. Temporary Emergency Action Plan | 1.000<br>EACH | _____.____ | _____.____ |
| 0164 | SPV.0060<br>Special 02. Emergency Response | 1.000<br>EACH | _____.____ | _____.____ |
| 0170 | SPV.0060<br>Special 05. Temporary Construction Access | 1.000<br>EACH | _____.____ | _____.____ |
| 0172 | SPV.0090<br>Special 01. Treated Timber Rub Rail | 174.000<br>LF | _____.____ | _____.____ |
| 0176 | SPV.0195<br>Special 01. Select Crushed Material for Travel Corridor | 588.000<br>TON | _____.____ | _____.____ |
| 0178 | SPV.0060<br>Special 06. Crosshole Sonic Log (CSL) Testing, Drilled Shaft Foundation 54-Inch | 6.000<br>EACH | _____.____ | _____.____ |
| 0180 | SPV.0060<br>Special 07. Thermal Integrity Profiler (TIP) Testing, Drilled Shaft Foundation 54-Inch | 6.000<br>EACH | _____.____ | _____.____ |
| 0182 | SPV.0090<br>Special 03. Drilled Shaft Foundation 54-Inch | 294.000<br>LF | _____.____ | _____.____ |

**Section:** 0001 **Total:** _____.____

**Total Bid:** _____.____